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# China Report

## AGRICULTURE

No. 125

FBIS FOREIGN BROADCAST INFORMATION SERVICE

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26 February 1981

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On behalf of all of us in FBIS I wish to express appreciation to our readers who have guided our efforts throughout the years.

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# CHINA REPORT

## AGRICULTURE

## No. 125

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## I. GENERAL INFORMATION

### CLEAR DISTINCTION BETWEEN MANAGING, ILLEGAL ACTIVITIES NEEDS BE DRAWN

**Beijing ZHONGGUO NONGMIN BAO [CHINA PEASANT NEWS] in Chinese 1 Jan 81 p 2**

**[Article by Wu Shizhong [6762 2514 6988], State Administration of Industry and Commerce: "Strengthen Sense of Responsibility to Policies, and Clearly Distinguish the Demarcation Line Between Legitimate Activities and Illegal Actions"]**

[Text] Ever since the Third Plenary Session of the 11th Party Central Committee, along with implementation of the principle of combining planned regulation with market adjustments in the national economy, liberalization of policies for regulating the marketplace has taken place. This has permitted agriculture, industry, and commerce to make fullest use of the role of market and price laws to accelerate commodity production, and enliven the flow of commodities. In agriculture, it has encouraged production teams to adjust general principles to specific situations, to develop crop diversification and the production of diverse commodities, and permit sale in the marketplace of excess agricultural products, except cotton, after fulfillment of state requisition purchase, excess purchase, and quota purchase quotas. Three categories of agricultural byproducts are under no planning restraints and may continue to be sold to the state or sold in any way deemed fit. Except for cotton, products derived from commune member private plots and household sideline occupations may be freely marketed, and raw materials that commune members need to engage in household sideline occupations may be freely purchased. So long as state plans are obeyed and contracts carried out, commune and brigade enterprises may sell their own products as needed. In the commercial sector, except in the case of state enterprises, cooperative stores and warehouses for trade, rural village market fairs have been revived; restrictions have been lifted on agricultural byproduct markets in urban areas, and there has been an appropriate revival and development of individual pedlars in cities and countryside. Components in the conduct of a diversified economy are the co-existence of multiple channels of circulation and diverse methods of operation. Gone is the former "this firm alone and no other branches" whereby state owned commercial firms dominated the scene. In pricing, different prices have been put into effect including list prices, added prices, and excess purchase prices for first and second category agricultural byproducts from communes and brigades, and for purchases by the state of different varieties, and requisition purchases of different quantities. Negotiated prices have been put into effect for third category agricultural byproducts. Products from commune and brigade enterprises and from individual handicraft industries that have been made from state-provided raw materials enjoy wholesale prices and are sold at list prices for state enterprises. Products made from raw materials that people have purchased by themselves may be sold at reasonable negotiated prices.

All operations and activities that conform to the above stipulations constitute legitimate trade and should be protected by government policies.

As a result of the effects of the mentality of the exploiting class and the capitalist operating style, as well as the force of habit of small scale production, certain amount of violation of established conduct for running the marketplace exists in the exchange of commodities. For example, some production teams disregard state plans and do not honor contracts selling for their own benefit at country fairs and agricultural byproducts they should turn over to the state instead of selling them to the state. When some commune members sell the products of their private plots for the products of household sideline occupations, they represent inferior goods as being first quality, give short measurements, and cheat the masses. They also may sell contaminated or rotting foodstuffs that damage the buyer's health. Some of them leave their production team to hawk their wares without permission from the production teams, thereby damaging collective production. In order to earn money, some commune and brigade enterprises use high wages or use 40-60 or 30-70 splits to hire people or to spur on personnel in their own enterprise to go out and sell their wares. Purchasing and marketing personnel are "thick as flies," inviting guests, sending presents, and using pull, wildly buying and recklessly selling without regard for quality or price. Some communes that operate sewing plants or cotton fluffing plants buy cloth ration coupons in the black market, which they use to illegally buy cotton cloth or cotton in state stores. Some state industrial and commercial enterprises unauthorizedly jack up the grade or the price, or copy trademarks, which they put on goods, to make them seem what they are not and raise the price accordingly. Some organizations, groups, units, and personnel in industrial or mining enterprises or units, make purchases on behald of their organization or barter agricultural byproducts privately and without authorization in rural villages or at trade fairs. Some residents of cities and towns as well as farmers become itinerant medical practitioners lacking certification, or offer bogus drugs for sale, or sell superstitious articles, or sell reactionary obscene books, pictures, and photographs. None of this is allowed.

Even more serious is that in their illegal operations, some units and individual seriously violate regulations on the management of currency, material resources, and the prices of goods to engage in speculative and profiteering activities. So called speculation and profiteering, to put it briefly, means to regard currency as capital and, with the goal of making exorbitant profits, to buy and resell or to deal in goods not actually in one's own possession, buying from one to sell to another, making profit on the transactions. It may also consist of adulteration or falsification and claiming that something bogus is genuine in order to swindle.

None of the above is allowed and is illegal. All who practice any of the following engage in speculative and profiteering activities: exploiters who make large scale resale of agricultural or industrial raw materials or are illegally involved in industrial, commercial, transportation, or construction activities, and hire labor; those who collude with every quarter, offer or accept bribes, embezzle, steal and sell, or transmit and sell, the means of production or the means of livelihood; those who seek exorbitant profits in black market transactions; those who speculate in order to swindle; those who hoard and corner the market in order to drive up prices; those who adulterate and falsify, misrepresenting the false as genuine thereby seriously harming production or the livelihood of the masses; those who make profit from the sale of credentials, receipts, or contracts, or who issue certificates so others may speculate or profiteer, issue receipts for others, make contracts for others, operate transportation for others, provide bank accounts, cheques, or cash; those who hide property for speculators and profiteerers and take a share in the loot; those who claim to operate enterprises or institutions in order to swindle and bluff and illegally engage in mass plunder of wealth or create serious harm; those who resell at a profit planned supply certificates or valuable negotiable securities from banks; those who resell for profit gold, platinum, jewelry, cultural relics, or costly Chinese medicinal items; those who resell foreign currency or imported goods, etc.

Ours is a socialist country in which every unit and individual must consciously abide by and carry out in an examplary way the policies of the party and the government, obey marketing and price regulation rules, and unremittingly struggle against illegal conduct that destroys state plans, destroys the economy of all the people and of the collective, and upsets the marketplace.

9432
CSO: 4007

## STATISTICS BUREAU'S INVESTIGATION OF RURAL ECONOMY SHOWS GAINS FOR COMMUNE MEMBERS

Beijing RENMIN RIBAO in Chinese 3 Jan 81 p 1

[Article: "Rural Per Capita Income Increased to 179 Yuan in 1979 According to Investigations by State Statistics Bureau on Household Economic Conditions of More Than 10,000 Commune Members"]

[Text] XINHUA, Beijing, 2 Jan--"According to investigations of 408 counties and 10,282 rural commune members' families in 23 provinces, municipalities and regions, the income of rural commune members from various sources was generally increased in 1979. Family sideline occupations also developed, but the income of some commune members was still very low." This is the view held by the State Statistical Bureau according to the result of an investigation.

### A Per Capita Income of 179.8 Yuan Representing an Increase of 29.2 Yuan and a Net Income of 160.2 Yuan, Representing an Increase of 26.6 Yuan Over the Previous Year

Below is a summary of the result of an investigation conducted among 10,282 commune members families in 1979:

There were altogether 58,153 persons in these 10,282 families averaging 5.66 persons per family; and 24,471 able-bodied persons, each supporting 2.38 persons (here and hereafter including the able-bodied person himself). Each person had an average of 0.18 mu under his private care including 0.15 mu of private plot.

In 1979, the income per person was 179.8 yuan, an increase of 29.2 yuan over 1979. After deducting for production expenses and tax, the net income was 160.2 yuan, which was 26.6 yuan, or 19.9 percent more than that of the previous year.

Of this net income, 102 yuan came from the collective. This was an increase of 13 yuan or 14.6 percent above that of the previous year. Another 44 yuan, an increase of 8.9 yuan or 25.3 percent increase over the previous year, came from family sideline occupations. Income from other sources was increased from 9.6 to 14.2 yuan, a 48.7 percent increase. The ratio of net income from the commune members' family sideline occupations to the total from other sources was raised from 33.4 percent to 36.4 percent; while the ratio of income from the collectives to the total net income was reduced from 66.6 percent to 63.6 percent. This reflects the trend of a fairly quick development of family occupations.

In 1979, the average net income from faily sidelines occupations for each person was 44 yuan, an increase of 8.9 yuan over the previous year. This was the fastest and largest increase in recent years.

Apart from slight reductions in fishing, hunting and gathering, all family sideline occupations showed increases in varying degrees. Because of the rapid development of family livestock breeding among the commune members, the large quantities of cattle and poultry products have greatly contributed to a brisk market, an increase of income for the commune members, and the improvement of people's living conditions. The conditions of the plots tended by the commune members themselves showed that economic crops had developed more rapidly than grain crops.

### Protection of the Rights of Ownership and Autonomy, Enforcement of the Production Responsibility System, Encouragement of Family Sideline Occupations Among Commune Members, and the Price Raise for Agricultural Sideline Products as Causes of Increased Income for Commune Members

The general increase of commune members' income from various sources is mainly attributed to the implementation of rural economic policies. First, the protection of the rights of ownership and autonomy of the communes, production brigades and productions teams and the enforcement of the production responsibility system have spurred the development of the collective economy and enabled each commune member to increase their earnings from the collectives in the forms of grain and cash by 36.9 jin and 7.1 yuan, or by 9 percent and 27.3 percent respectively over the previous year. Secondly, the commune members' management of their private plots, their private cattle-raising, and their participation in country fairs had been encouraged and supported. Thirdly, the increase of procurement prices for agricultural products had helped arouse the commune members' enthusiasm in developing commodity production and added to their gains.

### Ten Percent of the Households Had Net Income of Less Than 80 Yuan, and 3.7 Percent of Them Received Even Less Than 60 Yuan

It is noteworthy that the income of some commune members was still very low. Ten percent of the 10,282 families had net income of less than 80 yuan, and 3.7 percent of these families received less than 60 yuan.

The main causes of their low income were poor collective production, poor family sideline occupations, shortage of labor power and the large number of people to be supported. Among those whose net income was less than 60 yuan, each able-bodied person had to support an average of 2.74 persons, while those whose net income was more than 250 yuan had to support an average of only 1.9 persons.

9411
CSO: 8111/0589A

## RESULT OF INVESTIGATION OF FUNDS IN 637 PRODUCTION TEAMS

Beijing NONGCUN GONGZUO TONGXUN in Chinese No 12, 5 Dec 80 pp 12-13

[Article by Sun Pu [1327 2528] of Agricultural Bank's Main Office: "What Does the Investigation of Funds in 637 Production Teams Show?"]

[Text] In the first half of 1979, I took part in a typical investigation organized by the Main Office of the Agricultural Bank and conducted on the funds of communes and production teams.

The investigation covered 60 counties, 118 communes and 637 production teams in all 29 provinces, municipalities and regions throughout the country. The total income of the investigated units from agriculture, forestry, animal husbandry and fishery in 1979 amounted to 22.05 million yuan, a 12 percent increase over that of 1978 (the actual increase would be 6.3 percent if the portion resulting from increased prices were not taken into account). Grain output showed an increase of 9.1 percent over that of 1978, but the ratio of revenue from this source to the total revenue was lowered from 57.1 percent in 1978 to 55.6 percent in 1979. Revenues from economic crops, forestry, animal husbandry, sideline production, and fishery was 13.22 million yuan, an increase of 15.6 percent over that of 1978, and the ratio of these revenues to the total revenue was raised from 39.9 percent in 1978 to 41.2 percent in 1979. These figures indicate the fact that readjustments have already begun to take effect in the internal structure of agriculture. The general reserve fund amounted to 3.23 million yuan, a 10 percent increase over that of 1978, and the average income from distribution for each commune member was 126 yuan, a 15.5 yuan increase over that of 1978. The economic level of all these units was above that of the national level by at least 50 percent, but their reproduction funds were still very tight mainly for the following reasons:

### 1. Relations Between the State, the Collective and the Individuals Were Not Well Handled in the Distribution of Gains

In the majority of production teams, reserve funds for production expenses were not enough; in some of them, reserve funds were even nonexistent. In some cases, revenues from production increased by a wide margin and distribution among the commune members continued to increase; yet the collective reserve was on the decline. According to statistics on the 637 units investigated, the ratio of distribution among the commune members to the total income in 1979 increased by 30.8

percent over that of 1978, but the ratio of collective reserve to the total income dropped by 0.3 percent. Some production teams arbitrarily set the amount to be distributed among the commune members regardless of the development of production, and, as a result, the amount to be distributed was so large that little was left as reserve. This led to the falsification of reports on distribution. Instead of setting up any reserve fund for reproduction, some units even divided the public accumulation funds. Among the 10 units investigated in Gucheng County, Hebei Province, for example, five had divided up 20,950 yuan from the collective accumulation fund. The net income of the basic accounting units for 1979 in that province increased by 324 million yuan over that of 1978, but the distribution among the commune members increased by 327 million yuan. Thus the amount distributed exceeded the total net income by several million yuan, while the accumulation funds were reduced by 17 million yuan.

According to statistics of the investigation on 637 units, 332 production teams had set aside reserve funds for production expenses, and only 251 production teams had appropriated depreciation funds out of the funds for production expenses for the current year. Yet all these funds were very small. The production expense funds appropriated was only 370,000 yuan, being 1.2 percent of the total revenue and 3.3 percent of the total expenditure, and the accumulative total of production expense funds was only 3.25 million yuan, being only 28.8 percent of the total payment of production expenses. Current funds for production expenses of the units investigated in Hunan, Hubei, Shandong, Henan and Guangdong were less than 10 percent of the total annual production expenditure, and the contradictions brought about by the shortage of funds were quite obvious. In some investigated units, the average income from distribution per person was as high as about 200 yuan; yet there was no reserve for production expenses or depreciation funds. An analysis of investigation data has revealed that about 70 percent of the production teams lacked circulation funds for production expenses. For example, the total payment of production expenses in Shanxi Province in 1979 was 1.2 billion yuan. Except for some 400 million yuan spent on stored seeds and fodder, the remaining amount of more than 700 million yuan had to be borrowed from banks and credit cooperatives. In Changling County, Jilin, 15 communes and 412 production teams, being short of funds for buying chemical fertilizers, had to raise 340,000 yuan by borrowing from the commune members. These loans had to be redeemed after the autumn harvest at a high interest rate: 50 jin of wheat or 15 yuan in cash for every 100 yuan borrowed. In these units, the reserve funds for production expenses were small, and the retained depreciation funds were even smaller. In 1979, only a total of 225,000 yuan was retained, and this amount was only 1.4 percent of the total value of fixed assets. At this rate of retention, it would take 68 years for the fixed assets to be replaced once.

### 2. Capital Construction Had Not Been Confined Within Practical Limits and Had to Break into the Production Funds for the Current Year

According to statistics of the investigation, the total public accumulation fund for 1979 was 2.11 million yuan, being 6.6 percent of the total income (a reduction of 0.6 percent below that of 1978), but the payments made from the public accumulated fund amounted to 2.77 million yuan, an excess of 660,000 yuan over the established fund. There were even deficits in the public accumulation accounts of some production teams. In addition to capital construction and the purchase of fixed assets carried out beyond practical limits, the overspending in public accumulation funds is attributed to the following circumstances: First, a total of 110,000 yuan, or 18.2 percent of the total outlay from the public accumulation fund, had been apportioned among some communes and production brigades according to the practice of equalitarianism and indiscriminate requisitioning. Secondly, more than 960,000, or 34.7 percent of the total outlay, had been spent on nonproductive construction. Thirdly, some unprofitable engineering projects had been undertaken and some useless farm machines had been purchased. For example, some investigated units in Hunan Province had bought 35 sets of Fengshou Brand transplanters manufactured in Shanghai. These transplanters cost 135,000 yuan and turned out to be practically useless.

### 3. Large Amounts of Debts Were Owed by Outside Units and Commune Members

According to statistics of the investigation of 637 production teams, the total debts owed to these production teams by outside units amounted to 3.9 million yuan (averaging 6,122 yuan per production team). Among these units, those at or above the county level accounted for 8.7 percent of the total amount; those at the commune level accounted for 8.7 percent; those at the production brigade level accounted for 40.4 percent; other production teams not covered by the investigation owed 6.4 percent; and government cadres, workers and other people owed 35.9 percent. By the end of 1979, the commune members had overdrawn 1.89 million yuan (averaging 2,967 yuan for each production team). These two different categories of debts totalled 5.8 million yuan, an increase of 7.4 percent over that of 1979. At the same time, these 637 production teams owed outside units 2 million yuan, their own commune members 1.21 million yuan, and the banks and credit cooperatives 1.91 million yuan, all totalling 5.12 million yuan. Thus the balance sheet showed a credit balance of 700,000 yuan. [All figures as published]

### 4. There Had Been Excessive Production Expenses and Serious Losses and Waste

According to statistics, the expenses of these 637 production teams in 1979 showed an increase of 1,035 million yuan, a 10.1 percent increase over that of 1978. In the past several years, Baitanyi Production Team of Shangzhi County in Heilongjiang Province spent more than 41,000 yuan in buying 28 horses from other places and 27 of them died. Some production teams had also increased their expenditure by eating lavishly or engaging in nonproductive activities.

Some measures must be adopted to solve the above problems.

First, the production teams should be helped in correctly implementing the policy of distribution based on the principle benefits for the state, the collective and the individuals; in setting up accumulation funds; and in rationally adjusting the ratio between accumulation and distribution. Along with the readjustment of the relations of production, the policy of distribution for the basic accounting units should also be correspondingly revised. However, we must adhere to a cardinal principle, namely, provided there is increased output with increased income, we must be sure that the living conditions of commune members are improved and that the collective accumulations must be increased. In localities where production has levelled off or been reduced, any increase or reduction of distribution of commune members must be offset by a corresponding increase or reduction of collective accumulation.

At present, in the distribution of benefits, some localities have to practice fraud because, first, whatever is said by the higher authorities will be final, leaving the production teams little decision-making power; and, secondly, the masses are not sufficiently trusted so that questions as to how much for distribution and how much for reserve have to be decided according to the set patterns of "how much to increase and how much to reduce" as stipulated in some documents, instead of being decided through democratic discussions. As a result, what should be distributed is not rationally distributed and what should be kept in reserve is not kept at all. Under government leadership at various levels, the departments concerned should help the production teams audit their accounts, implement the policies and work out distribution plans so that appropriate action can be taken on distribution or the building up of reserve funds. In building collective reserves, priority should be given to production expenses by appropriately lowering the ratios of public accumulations and other reserve funds so that funds for simple reproduction for the current year can be insured. In those production teams where the level of distribution among the commune members is fairly high, efforts should be made to raise the amount of reserve for production expenses up to about 60 percent of the total outlay within 2 or 3 years. In production teams where the level of distribution is low, the time can be prolonged. This, in addition to the necessary support from banks and credit cooperatives, will provide sufficient funds for the overall development of agriculture, forestry, animal husbandry, sideline production and fishery.

Secondly, the farmland capital construction front should be appropriately shortened and commodity production should be vigorously developed. Some basic accounting units are now poor simply because they lack funds for developing commodity production. There must be a vigorous development of commodity production before the collectives and commune members can become well-to-do and the rural economy can undergo a fundamental change. An analysis of the data of investigation has shown that in 62 out of the 637 production teams where the average income from distribution per person was more than 200 yuan, the proceeds from cash crops and multiple undertakings amounted to more than 60 percent of the total revenue; and that in 47 production teams where the average income from distribution per person was less than 50 yuan, the proceeds from cash crops and multiple undertakings amounted to only about 30 percent of the total revenues. Therefore, we must use our limited funds mainly on the development of commodity economy, pay attention to economic results, and direct our efforts to what requires only small investments but yields quick and big gains.

Thirdly, we must pay particular attention to the settlement of outstanding debts owed by outside units and the commune members. Under government leadership at various levels, the departments concerned should help the production teams recover what others owe them to the maximum extent. Anyone in a position to pay their debts in time and yet failing to do so should be charged interest at the bank rates. The settlement of current accounts will gradually help establish a normal economic order in the countryside.

9411
CSO: 8111/0611

## NATIONAL

# EIGHT INDEXES FOR EXAMINING COMMUNE MANAGEMENT

Beijing GONGSHE CAIWU [COMMUNE FINANCIAL AFFAIRS] in Chinese No 2, 25 Mar 80 pp 20-21

[Article by the People's Commune Management Bureau of the Ministry of Agriculture: "Indexes for Reviewing Management of People's Communes"]

[Text] In January 1980, the Stage Agricultural Committee convened a National Rural People's Commune Management Conference. The conference discussed and revised the demands for seven increases and one decrease put forward by the People's Commune Management Conference convened by the Ministry of Agriculture and Forestry in January, 1978, made them into indexes for rectifying and improving management of people's communes, and demanded that they be well propagated so that cadres and commune members will strive to realize these eight indexes.

The eight indexes are: 1) Increase gross output of important products. In agricultural areas this means increasing the gross output of the important products of grain, cotton, oil, and hogs; in the suburbs of large cities this means increasing the gross output of vegetables and other sideline foods; in units which deal mainly in forestry, animal husbandry and fisheries, this means increasing the gross output of important forestry, animal, and fish products. 2) Increase gross income. This means gross income which can be included in the annual distribution. 3) Increase products turned over to the state for sale. This means increasing agricultural sideline products which are turned over to the state for sale, i.e., it reviews the improvement in the commodity rate of products. 4) Increase the average income share of commune members. 5) Increase production expense funds, accumulation funds, and public welfare funds retained by the collective. This means retention by the entire collective. Some units still include grain reserve funds and commune members' subsistence funds. This requires some explanation. Production expense funds are special funds used for production turnover. Only enough production expense funds can be retained progressively as required for the production turnover of 1 year of production to guarantee the normal progress of production. The production expense fund can be used only for production turnover; it cannot be used for capital construction or other expenses of a nonproduction nature. 6) Increase labor accumulation. Labor accumulation is one form of economic accumulation by collectives at China's present stage. Labor acculululation of basic accounting units means the use of man-days for initiating capital construction or fixed assets projects controlled by the unit. This portion of man-days used should be counted as "fixed capital funds" according to the planned cash value of a work point for that year. As for workdays used in agricultural capital construction transferred to nonbasic accounting units above the level of brigade, commune, and county, although the unit cannot create fixed capital, when auditing is done at year's end it should be pooled with the accumulated workdays of the unit in order to facilitate a comprehensive review of the labor accumulation situation. 7) Increase the average grain ration distributed to commune members. 8) Decrease item expenditures as a proportion of gross income. Item expenditures means production expenditures and management expenditures. Some units will also have other expenditures. When reviewing, in addition to reviewing gross expenditures as a proportion of income, there should be a review of any decline in production expenses as a proportion of gross income.

Realization of these eight indexes demands that managerial work be done well all year. In ordinary times of striving to increase production and economize, a comprehensive review is carried out in combination with the year-end distribution audit. As far as the basic accounting unit is concerned, these seven increase standards should be calculated as an average per capita for comparing the annual situation with the unit and for comparing it with different units.

Generally speaking, the eight review indexes are suitable for this 2- or 3-year period of rectification, but in the future, along with continuing developments in the agricultural economy, some items will have to be adjusted. If the commune members' grain ration increases generally, after production expenses and waste are greatly reduced this index may no longer be needed and newer indexes of higher demand will be proposed.

8226
CSO: 4007

# IMPROVEMENTS FOR GRADING COMMUNE ACCOUNTANTS SUGGESTED

Beijing GONGSHE CAIWU [COMMUNE FINANCIAL AFFAIRS] in Chinese No 5, 25 Sep 80 pp 33-35

[Article by the Commune Office, Bureau of Agriculture, Liaoning Province: "Views on Improving the Grading of Commune Production Brigade and Production Team Accountants"]

[Text] There are currently 105,000 accountants in the production brigades and teams in the rural areas of Liaoning Province: 90,000 in production teams, and 15,000 in production brigades. A production team and brigades accountant grading system should be implemented to mobilize the work initiative of rural commune financial accounting personnel,to improve the financial accounting ranks, to strengthen financial management, and to do a better job of adapting to the needs of agricultural modernization. The following views are proposed to improve this task.

1. Scope of review and technical titles. All accountants who currently hold posts in rural production teams and brigades should be reviewed. Those who meet comprehensive review qualifications should be awarded the title of accountant first, second, or third class and given an "accountant certificate." Those who do not qualify should become probationary accountants.

Qualifications for Accountant First Class are: be knowledgeable about accounting and well acquainted with financial accounting; have extensive practical experience and the ability to guide and train others; produce accurate, up-to-date, clear, and timely accounts; be able to analyze economic activity, to make proposals, and to have obvious achievements in financial accounting work.

Qualifications for Accountant Second Class are: have a command of a certain amount of accounting knowledge and be familiar with financial accounting; be able to guide; produce accurate, prompt, clear, and timely accounts; be able to complete work fairly well.

Qualifications for Accountant Third Class are: have a command of general accounting knowledge; keep and balance books, work out distributions, and be able to do financial accounting work independently.

Those who can basically keep and balance accounts with training and guidance are probationary accountants.

2. Review methods and content. The review method should be a combination of professional examination, evaluation of practical work, and democratic appraisal. Review content includes: a basic knowledge of accounting, practical accounting work, and an ability for economic management. In addition to the above, brigade accountants also should be reviewed for their ability to supervise accounting. The review should be a combination of theory and practice, examination and practical work, and professional assessment and democratic appraisal. Specific content and methods are:

(1) Professional examination: Standardized examination questions and an answer key should be prepared by the county agricultural bureau, and the examinations should be administered by the commune unit and graded on the basis of the standardized key. The examination content should include: principles of accounting; basic knowledge of commune and brigade accounting, ledgers, distribution accounting and methods of drawing up reports, analysis of economic activity and financial situation; and relevant party policies and accounting systems.

(2) Evaluation of practical work: Conducted by a unified organization of the commune. Brigade accountants should be evaluated by a commune review and grading leadership group. Production team accountants should be evaluated by a commune brigade group. The scope of the evaluation is the 1979 Profit Distribution Accounting Materials Report and the 1980 financial revenue and expenditure plan, accounts, documents, and public finance handbook. Evaluation content: whether the financial revenue and expenditure and profit distribution were conducted according to plan; whether the party policy was carried out thoroughly; whether the account records are accurate, prompt, clear and complete and the procedures sound; whether the accounting reports and analytical materials on economic activity are complete and correct and the accounting files are sound.

(3) Democratic appraisal: Mainly through a public forum of cadres and commune personnel--appraising the accountant with regard to financial management, thoroughness in executing policy, implementing the system, running the commune, conducting financial transactions democratically, economic activity analyses, work attitude, participating in labor, and heeding the views of the masses. Examination, evaluation, and appraisal count 100 points each. The total of the three parts determines the titles. Accountant First Class should have an average above 90, Accountant Second Class, between 80 and 90; and Accountant Third Class, between 60 and 80. Those whose grade does not meet the above qualifications are probationary accountants.

3. Examination and approval procedures. Accountant grading should be carried out under the unified leadership of the party committee. The county rural work section (or rural office), agricultural bureau, and revelant departments form an "Accountant Grading Leadership Team" and the commune should establish a similar group responsible for organizing, reviewing, evaluating and grading. Before the review, the county should issue an accountant examination review outline, carry out review sessions, and conduct registration at the same time. The accountants fill out an assessment grading form in triplicate. Then a meeting of commune members will consult the accountant's qualifications for grading, conduct a preliminary appraisal, and propose a grade. After the brigade party branch signs off, it will be reported to the commune. Review work will be conducted at the commune level. Review results and the proposed grades of two accountant classes will be offered by the commune grading leadership team and will be reported to the country grading leadership team for ratification. Accountants awarded titles of first, second and third class will receive an "Accountant Certificate" from the county.

Accountant review and grading will be conducted once every 3 years, and on the basis of the results of each review, an accountant's class may be raised or lowered. Accountants who have made serious mistakes may, with the commune's approval, be reduced in grade or have their "Accountant Certificate" taken away, depending on the severity of the infraction, after a report is made to the production team.

4. Technical pay supplement. Commune and brigade accountants are specialized technical personnel and their technical titles reflect the level of their professional skill and the responsibility they bear for the collective. Thus, accountants should be given technical pay supplements: an Accountant First Class should be provided with an allowance equal to 30 percent of his work points; an Accountant Second Class should be provided with an allowance equal to 20 percent of his work points; an Accountant Third Class should be provided with an allowance equal to 10 percent of his work points; and probationary accountants should not be granted technical supplements. Technical pay supplements are issued once a year by the production team or brigade and are added to distribution shares.

8226
CSO: 4007

## READER'S QUESTION ON 'EASY MONEYMAKING' ANSWERED

Fuzhou FUJIAN RIBAO in Chinese 15 Oct 80 p 2

[Reader's Letter on "How to Deal with 'Easy Moneymaking' Commune Members and Editorial Answer"]

[Text] Comrade Editor:

I have recently heard from some production brigade cadres that ever since the policy relaxation, some commune members have set up small business elsewhere and seldom participated in collective work. They were nicknamed by others as "persons making easy money." At present, nearly two-thirds of the people in every production brigade are making easy money and this is seriously affecting collective production. What can we do with these commune members?

Ai Nong [1947 6593]
Huancheng District, Fuzhou.

Commune members' business activities in village fairs are permitted under existing policies. However, these activities must be predicated on the fulfillment of the tasks of collective production. Some commune members are only concerned with their own "small business" and the increase of personal income. This is wrong.

In some places, as we understand, absentism is now on the increase because commune members are trying to "make easy money." This is largely due to the lack of adequate political/ideological education and economic work. Besides carrying out patient and meticulous ideological education among these commune members, it is also necessary to perfect the management of labor quotas and to set up a system of production responsibility. Economic management should also be strengthened, and reward and punishment be implemented. These commune members must not be allowed to act as they please.

9411
CSO: 4007

## 'RENMIN RIBAO' ON FRESHWATER FISH BREEDING

HK121300 Beijing RENMIN RIBAO in Chinese 15 Jan 81 p 2

[Commentator's article: "Accelerate Development of the Freshwater Fish Breeding Cause"]

[Text] At present, market supplies of meat, poultry and eggs are showing some improvement, but the contradiction between the supply and demand of aquatic products is becoming more prominent every day. In many cities and localities fish supplies are insufficient and the masses are unsatisfied with the situation. In the process of readjusting our country's national economy, we must do our utmost to overcome shortages in our aquatic produce enterprises to resolve the problem of the masses not having enough fish to eat.

In recent years, because our country's offshore aquatic resources have suffered serious depletion we must endeavor to control ocean fishing so that fishery stocks may recover and be replenished. Therefore, we must accelerate development of freshwater fish breeding enterprises by closing the gap in market supply caused by the reduction of the volume of offshore fishing. This drive to develop freshwater fish breeding is attributable neither to depletion of fishery resources nor to expediency but rather to the inevitable consequence of production development. Just as agriculture evolved from gathering to cultivation and animal husbandry from hunting to breeding, fishery will similarly gradually evolve from catching to breeding Today, our country's freshwater fish production occupies only one-fifth of total production and the water area utilized for breeding still has not attained two-thirds of its potential. Production levels for most of this utilized area are still rather low, average yield per mu being only about 30 jin. The development potential of freshwater fishery is therefore enormous. If this is to be tapped, strengthening leadership, positive reforms and pooling of human, material and financial resources are essential. We must make a success of freshwater fish breeding, protect and develop the aquatic resources of our rivers and lakes, particularly our most valuable aquatic flora and fauna.

To speed up development of freshwater fish breeding we must first make use of water area in the same way that we emphasize utilization of arable land. We must define water area management rights in order to eliminate as quickly as possible any wasted water area. All water areas belonging to the state may be state managed or managed jointly by the state and the communes or production brigades. Alternatively a water area may be assigned to communes or brigades for utilization and management. All collectively-owned water areas may be managed by local communes or brigades, but certain zones may come under the joint management of both the state and the communes or production brigades. However, management of water area spanning across a boundary is to be the responsibility of the higher authority. Scattered small ditches and ponds unsuitable for collective management may be assigned to individual commune members for utilization and management. All water areas whose management rights have already been designated, including those areas assigned to boat-dwelling fishermen whose livelihood depends on what they catch, must be fixed in the long term, be protected by the laws of the state and must not be altered lightly. At present, our country has more than 80,000 reservoirs, forming 40 percent of the inland water area available for fish breeding, less than half of which are being used for fish breeding, the average yield per mu being only 11 jin. Production potential is therefore enormous. The interests of surrounding communes and brigades are a factor to be taken into consideration in any use of large or medium sized reservoirs for breeding. At present, if no major problems arise, the management system should where possible be left unaltered; in the eventuality of problems arising, the methods of joint partnership and proportional profit sharing by parties concerned may be adopted so as to accelerate the rational utilization of such water areas and develop fresh water fish breeding.

In the same way as livestock and poultry need feed, so do fish. "Just as men eat fish, fish also must eat." The nutrients required for successful fish breeding are not present in plain water. As we increase the area of fish breeding and raise the level of yield and intensify breeding, the problem of feed will become more acute. Fish-breeding communes and brigades should retain grains to be used as feed and find land to produce feed. Units should also be encouraged to use land between ponds and streams in order to produce feed. Grain produced on such land is to be exempt from state purchase and is not to be used as grain ration. In some provinces and cities feed grain is exchanged for freshwater fish in order to promote development of fish breeding. Practicing the methods of whoever purchases fish gets the grain and whichever level sells fish gets the grain, particularly in concentrated producing regions where the quantity of commodities is considerable and where the feed material problem is fairly acute, has its merits and may spur the communes and brigades to supply more commodity fish, which is advantageous both to the state and the producers.

Freshwater fish breeding requires fixed investment. Under the prevailing conditions whereby the stage cannot provide anymore funds, an effective channel is to actively promote economic integration. To develop fish-breeding production we must encourage the methods of joint management and integrated management between the center and the localities, the state and the collectives, production and marketing regions, as well as between departments, trades, regions and communes and brigades. Integration may entail communal investment, unified management, communal responsibility for profits and losses; it may entail financial investment on one hand and manpower investment on the other, with division of the products on a precentage basis; it may also consist of investment by the marketing regions and repayment by the producing regions with products. In sum, it entails spontaneity and mutual benefit, joint consultation and adoption of diverse forms.

We must endeavor to raise the level of scientific fish breeding by establishing bases for fish breeding and for breeding improved varieties. New feed sources must be tapped and we must strive to experimentally popularize mixed feeds; we must strengthen prevention and cure of fish diseases. In short, we must encourage rational use of resources, change the structure of agriculture and promote mutual experiences of fishery and grain. Counties where the conditions are right must set up technological promotion stations to disseminate scientific techniques on fish breeding to the masses.

In management, we must create and perfect various forms of production responsibility systems according to the actual situation. Specialized farms and brigades in concentrated production regions can generally implement contracts dealing with organization, practice reward systems and engage in joint production. In rural areas, orders, contracts and profits from subsidiary fish breeding may be divided, according to principles of convenience of production and advantageous management, among specialized groups, households and individuals. The method of production contracts may be used to fix production according to ponds or by voting on contracts; these may be fixed for 1 year or remain unchanged for several years. In practicing various responsibility systems, joint contracts must be signed and strictly adhered to. Practice in many places illustrates that once production responsibility systems are implemented, fish yields double and redouble.

The people's livelihood needs aquatic products and national construction needs aquatic products. We must mobilize several hundred million people, use all available manpower, adopt various forms and various methods and bring every positive factor into play--the state, the collective and the individual--to strive within a few years to fully utilize the breeding areas to bring about fairly fast and large-scale development of our country's freshwater fish breeding.

CSO: 4007

## BRIEFS

ANIMAL HUSBANDRY -- Total national pork, beef, and lamb output in 1980 is forecast to increase over 1979 with more than 22 jin per capita. Increased growth in Sichuan Province has been quite rapid from an average 22.8 jin per capita in 1979 to a possible 30 jin per capita in 1980. Because of a drought in pastoral areas this year, which caused a shortage of grass, and a decrease in grain output in most agricultural areas this year, plus "difficulties in selling pork" prior to September, development of the livestock industry has definitely suffered. However, as a result of the liberalization of policies, readjustments in the price of pork, a very high enthusiasm among the broad masses of farmers and herdsmen to engage in animal husbandry, an increase has occurred in both the slaughter rate and the commodity rate. According to statistics for the period January to October, the number of live pigs on hand decreased by 2 percent, but the number of live pigs purchased by the state increased by 2.6 percent, and pig sales increased by 4.2 percent. Average weight per pig increased 7.1 jin, and the dressed rate increased by 5.8 jin per pig. According to statistics from some provinces and municipalities, there will be an increase of about 5 percent in the number of sheep and goats. An increase also took place in output of large livestock, reversing a tendency toward decline over the past several years. Poultry and rabbits have also increased. The extent of increase in livestock products has been even greater. An increase of 20 million pigskins is predicted. Statistics from some provinces and municipalities show a 37 percent increase in rabbit fur. During the first half of the year, state procurement of lamb's wool increased 27.2 percent and sheep hides increased 14.2 percent; goat skins increased by 45.6 percent, and cowhides increased by 31.4 percent. Authorities in agricultural units believe that the livestock industry is headed for an increased in the commodity rate, but at the same time appropriate growth in the number of head of cattle is also needed. They also pointed out that as a result of the lack of grass in pastoral areas last winter and this spring, urgent and meticulous attention must be paid to wintering over problem for livestock. The decline in the number of sows in farming areas has aroused concern, and there is particular need for a consistent policy of rewards to maintain hog raising. [Text] [Beijing ZHONGGUO NONGMIN BAO [CHINA PEASANT NEWS] 8 Jan 81 p 2] 9432

WATER CONSERVATION BENEFITS -- During the flooding in the south and the droubht in the north of China in 1980, water conservancy projects showed how useful they can be. During flood season, the Yangtze River reached a flood stage unequaled except in 1954 and 1931. All the way from Shashi in Hubei Province to Shanghai, the water level was higher than the land, but no breaches occurred in the Yangtze River dikes or in the protective embankments in the lakes area, and the safety of cities along the river and the plains on both banks was maintained. Hubei Province has a more than 3000 cubic meter per second water pumping capacity, and during flood stage it pumped more than 15 billion cubic meters of water into the Yangtze. This is more than the capacity of three Miyun reservoirs. Only somewhat more than 6.4 million mu of the more than 19 million mu of the area innundated throughout the province became a disaster area. In Jingzhou Prefecture alone, pumping of water saved more than 5 million mu of crops reducing grain damage by 2.5 billion jin, which translates into 287 million yuan, while expenses involved in draining away the water amounted to only somewhat more than 15 million yuan. Likewise in combating drought in the north, water conservancy projects played an outstanding role. "With water, there is an expanse of green; without water, there is an expanse of yellow." During the long period of severe drought in Beijing and Tianjin, the two cities depended on the two great resevoirs at Guanting and Miyun to assure water to meet the needs of industrial production and metropolitan life. The outstanding benefits provided by water conservancy projects aroused the enthusiasm of the masses to undertake water conservancy. Many places in the south made rush repairs on ditch systems in the fields, and in the north there was crash sinking of wells and fitting pumping equipment to wells. Great progress was also made on key projects. First stage work was virtually completed on "Great Wall Number 1 Dam," the pivotal water conservancy project at Gezhou, Hubei Province. On 4 January this year, the closure to interrupt the flow of the Yangtze River was successfully joined. This marks the first time in history that the Yangtze River has been interrupted across its width. Once the second phase of the project begins, it is expected that within about half a year ships will be able to navigate through locks and generation of 170,000 kilowatts of electricity will begin. [Text] [Beijing ZHONGGUO NONGMIN BAO [CHINA PEASANT NEWS] in Chinese 8 Jan 81 p 2] 9432

HYBRID SEEDS USAGE -- New developments have taken place in China's seed work during 1980. More than 320 counties have adopted "four -izations and one supply" for seeds (specialization in seed production, mechanization of processing, standardization of quality, regionalization in the distribution of varieties), and organization of unified supply of seeds with the county as the basic unit. Furthermore 41 counties have established the "four -izations and one supply" for cotton with two modernized seed processing plants and a group of seed production bases. The "four -izations and one supply" for seeds gives impetus to the spread of superior varieties and promotes increased output on large fields. Last year hybrid rice was grown on an area of more than 79 million mu, an expansion of 3 million mu over the previous year for a between 20 and 30 percent increase. There were 214 million mu of hybrid corn, an expansion of 10 million mu over the previous year or an increase of between 10 and 20 percent. The hybrid cotton demonstration area was extended to the planting of more than 100,000 my, from which increased output upward of 10 percent was harvested. Because of the poor quality of hybrid varieties of gaoliang, their planting has fallen since 1976, but in 1980, because of the spread of several new hybrid varieties with high output and good quality, the planting area began to climb. New hybrid varieties of gaoliang accoutn for 50 percent of the area sown to gaoliang. Seeds companies at all levels overcame bad climatic conditions of numerous kinds that caused difficulties for the breeding of seeds, reserving of seeds for planting, and state procurement of superior varieties of seeds to handle 3.7 billion jin of superior varieties last year, a 700 million jin increase over 1979 and accounting for more than 12 percent of the quantity of seeds required nationwide. This was about enough for sowing last fall and winter, and for sowing this year. [Text] [Beijing ZHONGGUO NONGMIN BAO [CHINA PEASANT NEWS] in Chinese 11 Jan 81 p 2] 9432

VILLAGE FAIRS' BRISK BUSINESS--Beijing, 7 Feb (Xinhua)--In 1980, despite natural disasters and lower grain output, business was brisk at the more than 37,000 village fairs in China. There was a big increase in the number of farm and sideline products sold at the village fairs with prices remaining stable. According to statistics of the general administration of industry and commerce, the total amount of farm and sideline products sold at the 206 fairs under its control was 574.46 million yuan in 1980, an increase of 37.4 percent over that in 1979. Among 10 major products, the prices of rice, wheat, corn, edible oil, pork, cabbage and young pigs actually dropped. Prices of tobacco, eggs and firewood showed a little increase. [Beijing Xinhua Domestic Service in Chinese 0018 GMT 7 Feb 81]

ENTERPRISE REVENUES--Total revenues of commune- and brigade-run enterprises in China amounted to 56.5 billion yuan in 1980, topping the previous year by 13 percent. [Beijing Domestic Service in Mandarin 1200 GMT 14 Feb 81 OW]

CSO: 4007

## BRIEFS

**AGRICULTURE HARVEST**--Thanks to ideological and political education for cadres and commune members, Su County reaped a bumper harvest of agriculture in 1980. According to statistics, the county's total grain output exceeded 740 million jin, or 4.8 percent more than 1979. In addition, the county's total yield of oil-bearing crops exceeded 20 million jin and total ginned cotton output reached 8.40 million jin. [OW180113 Hefei Anhui Provincial Service in Mandarin 1100 GMT 15 Feb 81]

**FIELD MANAGEMENT**--As of 11 February, 280,000 mu of wheat fields have been topdressed in Wuhe County, Anhui. The county has 680,000 mu of wheat. [OW180113 Hefei Anhui Provincial Service in Mandarin 1100 GMT 16 Feb 81]

**FOREST FARM**--Hefei, 17 Feb (Xinhua)--Since 1971, communes and brigades in hilly areas of Huoshan County, Anhui, have run over 200 forest farms, planting trees on more than 178,000 mu, including China fir trees on 87,000 mu. Last year the county's communes and brigades reclaimed 78,000 mu of woodland. The county also supplied collectives and individual commune and brigade members with 13.4 million saplings last year. [OW180113 Beijing Xinhua Domestic Service in Chinese 0030 GMT 17 Feb 81]

**FIELD MANAGEMENT**--The peasants in Anhui's Lingbi County are engaged in managing the county's 1.04 million mu of wheat at present. [OW180113 Hefei Anhui Provincial Service in Mandarin 1100 GMT 17 Feb 81]

**RURAL ECONOMY**--The total grain output of Huaibei Municipality, Anhui Province, was 740 million jin in 1980. The average cash income of commune members in the rural areas of the municipality was 65 yuan, increasing 15.4 percent over 1979. The average income of peasants in the suburbs reached 118 yuan in 1980. The average annual income of staff members and workers of state enterprises in the municipality was 880 yuan in 1980, increasing 11.8 percent over the previous year. [OW192325 Hefei Anhui Provincial Service in Mandarin 1100 GMT 19 Feb 81]

CSO: 4007

## RATIONAL PLANTING SYSTEM FOR MOUNTAIN REGION DEVELOPED

Fuzhou FUJIAN NONGYE KESU [FUJIAN AGRICULTURAL SCIENCE AND TECHNOLOGY] in Chinese No 5, 10 Oct 80 pp 5-9, 31

[Article by Ke Wentao [2688 2429 3447] and Chen Renzhen [7115 0086 3791] of the Crop Rotation Institute of the Fujian Provincial Academy of Agricultural Sciences: "Agricultural Resources of Northern Fujian and Rationalization of the Planting System"]

[Text] The mountain region of northern Fujian is the base of our province that produces the most commercial food grain products and the largest forestry base. Our province has a total of 13 commercial food grain bases, and 7 (Jianyang, Jiaon, Puchen, Congan, Shunchang, Ninghua, Jianning) are in the mountain regions of northern Fujian. The total yield of food grains of northern Fujian constitutes about 30.28 percent of the total yield of food grains of the province. The amount of logs felled, in 1975 for example, according to incomplete statistics, by the area's production brigades and production teams constitutes 71.54 percent of the total amount felled by the production brigades of the entire province. The areas suitable for planting grass on mountains and the area of grazing fields between forests are large and they can be used to raise cattle and sheep and such grazing animals. The conditions of the natural resources are superior and are suitable for balanced development of a combination of agriculture, forestry and livestock production. Therefore, adjusting and reforming the natural resources and the planting system in the mountain regions of northern Fujian well, and rapid development of agricultural production, will hasten the realization of agricultural modernization in our province and these have their practical and important significance. Now, preliminary views concerning the reform of the planting system in the mountain regions in northern Fujian based on the results of survey and analysis of related information are proposed as follows:

### I. Analysis of the Conditions of Agricultural Resources in Northern Fujian

The mountain regions of northern Fujian include the Jianyang area, Sanming area and Ningde area, covering 25 counties and cities of Gutian, Pingnan, Zhouning and Shouning. The entire region has a total population of 4.293 million (1978), constituting about 21.6 percent of the total population of the province. The planting area of the entire province. Per capita average is 1.61 mu of cultivated land, and 12 to 13 mu of forest land, leading the province. The region is an area of the province that has less people and plenty of land. The area of paddy fields constitutes 94 percent of the total area of cultivated land, farmland constitutes only 6 percent. The region is the food grain producing region that produces mainly rice grains and the region having the largest area of paddy fields in the whole province.

This region belongs to the middle subtropical area of cool temperatures. The annual average temperature is 12°C to 19°C. The vertical climates are very visible and "each mountain has four seasons" and "the weather is different every 10 li." These are the most outstanding characteristics of the climate of this region. The frostless period is 220 to 300 days, the active cumulative temperature of daily average temperatures $\geq$ 10°C is 4500°C to 5800°C. Considering the heat sources needed during the growth period of double season rice, most of the region except the high mountain zone is suitable for planting double season rice. The annual sunshine is 1,700 to 2,000 hours. The total annual solar radiation is 106 to 115 kilocalories/square centimeter. The amount of radiation is the greatest in July and August, and the least from December to February. Heat sources are rich in summer and autumn and a fairly large amount of heat can be obtained in winter. Fully developing the superiority of natural resources, suiting measures to local circumstances and developing a multiple cropping system are still important ways to increase food grain production in the future. The amount of rainfall of this region is rich, the climate is moist and foggy, the amount of annual rainfall over the broad basins and hilly regions is 1,600 to 2,000 millimeters, the amount of rainfall over most of the mountain areas is 1,800 to 2,200 millimeters.

Rice fields are generally divided into three types, the even and flat fields (fields in plains), mountain ridged fields and mountain row fields (terrace fields). The mountain ridged fields cover the largest area. According to the conditions of heat resources, socioeconomic conditions and the standard of planting, the distribution of rice fields can in general be divided into three types:

1. The region below 500 meters above sea level: According to survey data of the Sanming area, cultivated land below 500 meters above sea level constitutes 68.9 percent of the total area of cultivated land. This can generally reflect the elevation of the cultivated land of this area. Heat source of this area is rich, the annual average temperature is generally 16°C to 19°C, the active cumulative temperature of daily average temperatures $\geq$ 10°C is 5200 to 5800°C, sunshine is sufficient, and the temperature and heat conditions required for the growth of double season rice can be satisfied, and it is a safe growth region for double season rice.

2. The region between 500 and 700 meters above sea level: This is the transient region for double season rice. Basically it possesses the temperature and heat conditions for the growth of double season rice. Analysis of related data shows that the safe growth period for paddy rice in this region, generally from the safe sowing time of early rice to the safe full heading time of late rice, is about 180 to 190 days. The annual average temperature is 16 to 19°C. According to studies, the total number of days of 10°C to 20°C for the safe

growth periods of two seasons of double season rice is 185 to 245 days (including 10 days for double shift farm work). This shows that the safe growth period for double season rice in this region has approached the lower limit and the seasons are relatively tight. Autumn cold arrives early, or the areas for double season rice and the local labor and animal forces and fertilizers and such conditions for production are not matched, and reduced yields frequently occur and the yields of two seasons are less than one season. Part of the rice fields even does not produce any harvest.

3. The region above 700 meters above sea level: The mountains are high and the water is cold. The period of sunshine is short, the temperature and heat conditions are poor, the annual average temperature is only 12° to 16°C, the frostless period is generally 220 to 250 days. The temperature and heat conditions cannot satisfy the demands of double season rice, and the region is unsuitable for developing double season rice.

## II. Evaluation of the Types of the Present Planting Systems in Northern Fujian

1. Rice-Rice-Soaking and Winter Fallow Land: This land constitutes about 35 to 75 percent of the rice fields. But the ecological environment in winter is not utilized, and natural resources are wasted. The causes that create soaking in winter and fallow land are: (1) Water conservancy conditions of the rice fields have not been improved, and to facilitate planting and to prevent spring drought, deficiency of water and dissolving of the fields, winter water must be retained and the land kept in fallow. (2) There is a lack of superior varieties for winter planted crops, the yield is low, the management is not refined, the income is low, the masses are not willing to plant in them, and the land is left for overturning in winter and to dry, or the land is allowed to become hardpan and not overturned. Soaking the fields in winter is a tilling method of rice fields to produce stable yields where the source of water is deficient. This method has also served production to a definite degree but because of the long period of soaking in winter the duration of waterlogging of the rice fields is prolonged, intensifying the conflicts among water in the soil, aeration, heat and fertilizers in the rice fields, causing the physical and chemical properties of the soil to become poor. Therefore, the region must be developed towards triple cropping a year on the bases of a comprehensive reform centered around improving the soil and controlling water.

2. Rice-rice-astragalus: This area constitutes 16 to 75 percent of the rice fields. The system combines utilization and nurturing of the land. Viewed at present, planting more and planting well astragalus is the most practical and feasible measure to solve the source of fertilizers. In view of the future, its potential is the greatest, it is an important link in the nitrogen cycle in the agricultural ecological system. It is the tie that binds agriculture and animal husbandry.

3. Rice-rice-rape: This constitutes about 9 to 16 percent of the rice fields. Developing winter planted rape satisfies the need of the masses for edible oil and the cakes and remnant roots, leaves and stalks are also good sources of organic fertilizers, and it possesses the effects of paddy and dryland crop rotation. It is a planting system that combines utilization and nurturing of the land.

4. Rice-rice-wheat: The masses are not willing to accept the results of test planting over the past 10 years. The reasons are: (1) In northern Fujian, there are many days of overcast and rain in March and April, the number of hours of sunshine are few, and these are unfavorable to heading and flowering of wheat. Cereal scab disease is serious and widespread. The yields are low and unstable. Generally, per mu yield is only several dozen jin. Some of the land even does not produce any harvest. (2) Wheat requires a lot of fertilizers, if fertilizers and labor cannot catch up, the yield of the latter crop of paddy rice is seriously affected. For the past 10 years, many attempts have been made and many have failed. Therefore, the masses are not willing to accept this kind of a planting system. But there are cases of fields producing a per mu yield of 300 to 400 jin of wheat.

5. Rice-soybean-rape (green manure): This constitutes about 0 to 9 percent of the rice fields. Autumn soybeans used to be planted in the fields of alluvial plains on the two banks of streams and rivers. The fields easily dry up. Because of improvement of water conservancy conditions, the area of double season rice has gradually expanded, and the varieties of soybeans degenerated and the yield decreased. The harvest was not as much as the yield of double season and late crops, therefore the area of this planting system that combines utilization and nurturing of the land gradually decreased. At present, this system can only be used for planting in oasis fields and exposed fields and terrace fields deficient in water and arid in summer.

6. Single season rice-winter soaking as fallow land: This planting system constitutes a large portion of land at present in the mountain regions of northern Fujian. The system is being used not only in middle and high mountain regions where the conditions of temperature and heat resources are poor, a part of the land in the low mountain valleys and basis is still reserved for this system. This type of planting system wastes a lot of natural resources, and in the future, experimental and research work need to be further strengthened, a way to rationally utilize this ecological environment should be actively explored to increase material wealth for rapid development of agriculture.

## III. Ideas on a Rational Planting System for Northern Fujian

At present, the area of double season rice of the entire region constitutes 59.55 percent of the total area of rice fields. The multiple planting index has reached 195.43. The per mu yield of food grains in the two regions of Jianyang and Sanming has already surpassed the "guideline," and the achievements of reforming the system have been great. But in the course of development, some problems also exist. For example, some localities neglected the objective and the subjective conditions and blindly propagated double season rice. More labor was used but harvest did not increase, the planting system was changed but yields did not increase. The costs were high and gain was small and the yields and harvests even decreased The planting structure was simple, the crops were planted continuously throughout the year, the crop distribution was irrational, utilization and nurturing of the land were not combined well, therefore the fertility of the land gradually dropped and the agricultural ecological system was not balanced. Diversification could not be fully developed. Now we propose some views of reforming the planting system in the mountain regions of northern Fujian:

### (I) Fortifying the Low Mountain Valley Land, Adjusting the Mid-Mountain Zone, Work for Unit Area Yield

In the region below 500 meters, the weather, labor, soil conditions and standard of planting are all basically suitable for the growth of double season rice. Except for a few mountain ridged fields of cold, muddy and acidic soil that has not been improved, double season rice can be planted in the majority of the rice fields. Many years of practice prove that commune brigades that plant double season rice and can produce high and stable yields should fortify and stabilize the area of double season rice, they must not go backwards. But commune brigades that produce low unit area yields during the early and late season and have very large areas of winter fallow land should increase the unit yield of early and late rice and expand winter planting as the main way to increase yield in the future. The mid-mountain region is the transient zone for double season rice, the fields are mostly further away from the villages, and a lot of work is involved in planting double season rice. Frequently, the seasons cannot be grasped, planting is not refined, the yield is low and planting more will not produce more harvest. Therefore, the planting area of double season rice must be considered from actuality, measures must be suited to the local circumstances, and appropriate adjustments should be made. Efforts can be better concentrated after adjustment, the season can be grasped, and food grain production can be increased. At the same time, this is beneficial to arranging for a part of the labor force to develop diversification for overall development so that there will be food grains and money. The natural resources can be fully utilized and the standard of living of the masses can be elevated. In the high mountain regions the amount of heat resources is insufficient and planting well single season rice to increase unit yield should be the main measure.

Viewing the entire mountain regions of northern Fujian, the unit yield is still low and the potential for increased yields is still very great. Among the regions, between the early and late seasons, between the high yielding commune brigades and the low yielding commune brigades, the yields are vastly different. By stimulating the low yielding commune brigades to catch up with the high yielding commune brigades and the yield of the late season to catch up with the early season, the amount of increased yields is very formidable. Last year, the Sanming region produced an amount of food grains that surpassed the "guideline." The average per mu yield of double season rice was 935 jin, but there were still some 200,000 mu that produced less than 800 jin. The single season rice covers 710,000 mu. The unit yield was only 520 jin. There is nearly 1 million mu of low yielding fields. In addition, the average per mu yield of 1.5 million mu of double season late rice was only 435 jin, less than the per mu yield of 500 jin of the double season early rice by 65 jin. If the 1 million mu of low yielding fields can produce an increase of 100 jin per mu, the amount of food grains can be increased by 100 million jin. If the 1.5 million mu of double season rice can produce more in the late crop than in the early crop, each mu can produce 70 jin more in yield, and the amount of food grains can increase again by over 100 million jin. With these two items, the Sanming region can increase the yield of food grains by over 200 million jin. Jianyang and Ningde regions also have similar potential.

## (II) Develop the Superiority of Natural Resources, Suit Measures to Local Circumstance and Establish a Rational System of Rotation

The winter fallow fields of the mountain regions of northern Fujian constitute over half the rice fields. This is a great waste of resources. The nature of agricultural production is the utilization of sunlight to manufacture products. To fully utilize solar energy is the basic condition for producing high and stable yields of food grains. Of the biological yield, only 5 to 10 percent of substances come from products of photosynthesis. According to calculations, the greatest theoretical value of the percentage of utilization of light energy by crops can reach above 10 percent, but the average percentage of utilization of light energy in our nation's farmland is less than 1 percent, therefore the potential for increasing the yield by improving the percentage of utilization of light energy is very great. At present, the United States and some nations have included improvement of the efficiency of light energy in the nation's key research topics. How can the percentage of utilization of light energy be improved? On the one hand, the farmland must have the greatest effective total area within the year, on the other hand, throughout the year, space must be seized with time, land must be fully utilized, the total leaf surface area throughout the year in the farmland must be increased. Absorption and conversion of stored nutrients in green plants must be increased. Solar energy must be stored and more agricultural products must be manufactured. These are important ways to increase the unit yield of farmland and the total yield in our nation at present. Therefore, fully utilizing the ecological environment of the winter season and expanding the area of winter planting are ways to increase the yield in the mountain region of northern Fujian. At present, the largest area of winter plant is astragalus while rape and wheat are planted in very small amounts. Because of the singular planting system, continuous cropping over long periods necessarily occurs, resulting in less opportunities to till the soil when it is dry and dry out the soil, the fields are soaked in water for a long time. The soil layer becomes shallow. The structure is destroyed. Aeration is poor, water, fertilizers, aeration and heat are not coordinated and unit yield of food grains remains stagnant and does not increase. Therefore, the area for planting rape must be expanded. The aeration and permeability of the soil must be improved. These are favorable to combining utilization and nurturing of the land and sustaining increased yields. The 16 mu of rice fields of the Dayuan Brigade of the Dayuan Commune in Jiangle County were planted with double season rice-astragalus each year. The yield of early rice remained between 500 and 600 jin. In the winter of 1975, the system was changed to planting one season of rape, and the per mu yield of early rice reached 690 jin. Wheat has a low yield in the mountain regions of northern Fujian and disease is serious. At present, wheat can only be planted at commune brigades that till the fields finely and plant carefully, and in fertile soil where labor is readily available, irrigation and drainage are convenient and the sources of organic fertilizers are plentiful. Dayuan wheat is resistant to rust disease, produces a stable yield, and requires less fertilizers and work than planting ordinary wheat, and it is the source of fine feed, beneficial to combining agriculture and animal husbandry. It is planted in scattered fields in such counties as Jiangle, Shunchang, Pingnan and Songxi. The per mu yield can reach 200 to 300 jin. It should be planted over a definite area as a winter planted crop. Summarizing the above, in low mountain valley land, the several planting systems of green manure-rice-rice, rape-rice-rice, wheat-rice-rice, fallow land-rice-rice should be organized for a small rotation in winter between the years to fully utilize the light and heat resources in winter, improve the soil structure, increase food grain yields, use crops to nurture crops, use fields to nurture the fields, and carry out nurturing of the land in use. This is the effective measure to bank fertilizers and soil fertility and sustain high yields practiced for several thousand years in our nation.

The mid-mountain region is the transient zone for double season rice. Double season rice should be coupled in rotation cropping in the double cropping cropping system and the triple cropping system with rice-rape, rice-soybean, rice-green manure, rice-potato, rice-corn. Measures should be suited to local circumstances, the land should be utilized, labor forces should be adjusted, the seasons should be grasped, the favorable conditions should be pursued and the unfavorable conditions should be avoided, the yields should be increased, the multiple planting index should be elevated, and the multiple cropping system should be developed. These should not be limited to developing only double season rice. Where human and animal labor conditions and heat resources allow, the production team can plant a definite area of double season rice and the remaining area can be planted with intermediate rice-autumn soybean, intermediate rice-autumn corn, intermediate rice-autumn potato, intermediate rice-green manure. At places where conditions are good, a part of the land can be used for planting the triple cropping system such as rice-autumn soybean-rape (or barley) and rotated with the double cropping system to achieve five croppings a year. In 1979, our institute conducted a double cropping experiment of rice and miscellaneous grains on the "broom ridged fields" at 650 meters above sea level at the Xiashanxi Brigade of the Longchuan Commune in Jiano County. That year, autumn cold arrived early and part of the double season late rice was affected. The experiment showed that the yields of rice-autumn soybean, rice-autumn potato, rice-autumn corn showed an increase of 27.2 to 56.7 percent over single season rice and about 26.2 percent over the double season rice.

In the high mountain regions, only one season of paddy rice is planted a year. Light and heat resources are greatly wasted. In one year, the rice fields are in fallow for half a year. According to statistics of related data, the average cumulative temperature over the years from the middle 10 days of November to the last 10 days of May in the high mountain regions is about 2300°C. Rape requires a total cumulative temperature of 1600 to 2180°C from transplanting to maturation, therefore, besides planting one season of single season rice, another season of rape can be suitably planted, but it must be sown in time to prevent frost damage. Potatoes like cold and cool weather. They are suitable for planting on high mountains. In 1978, the Mingxi agricultural techniques station conducted a spring potato-rice-rape-rice experiment in the high mountain region. The per mu yield of spring potato was 1100 jin. The yield of rice was 720 jin. The yield of rape was 85 jin. The latter rice crop yielded 959 jin. The high mountain region can also serve as the seed plot base for astragalus. This banks fertilizers and soil fertility and solves the source of seeds. In 1978, the Aotou Brigade of the Huangkang Commune in Jianyang County experimented with the planting of one season of hybrid superior rice and one season of astragalus for seeds. The 70 mu of Siyou No 2 produced a per mu yield of 677.8 jin. The astragalus left for seeding averaged 30 jin per mu equivalent to 210 jin of grains. The two totaled a per mu yield of 887.8 jin, surpassing the "guideline." Therefore, the planting system in the high mountain regions should mainly be the planting of one season of hybrid superior paddy rice and measures can be suited to local circumstances to plant potato, rape and establish a base for seeding astragalus.

### (III) Actively Reform Mountain Ridged Low Yield Fields, Promote Large Area Balanced Increases in Yield

The mountain ridged low yielding fields of the mountain regions of northern Fujian constitute about 40 percent of the total area of rice fields. This seriously affects the increases in the total yield of food grains. Reforming the fields well in parts according to plan is an effective measure to dig for the potential for increasing production. The mountain ridged fields have a large area that is shaded. Sunlight is insufficient and the period of sunshine is short. The rice fields are waterlogged throughout the year. The temperatures are low. The temperature of the water is low. The temperature of the soil is low. The level of underground water is high. The humidity is high causing the soil to be cold, muddy, rusty, acidic and other unfavorable conditions. This causes a lack of coordination of the water, fertilizers, heat and aeration in the soil, poor aeration, slow decomposition or organic matter, and reduced yields of food grains. Therefore, comprehensive measures of reform centered around improving the soil and controlling the water must be taken. Waterlogging conditions must be eliminated. The water level must be lowered. The unfavorable factors of coldness, muddiness and rustiness of the soil must be eliminated so that the physical and chemical properties of the soil can be improved and a favorable environment for the propagation of aerobic microorganisms can be created so that organic matter can be easily decomposed for paddy rice to absorb and utilize. Infertile fields are changed to fertile fields, and thus, the unit yield of paddy rice planted in the mountain ridged fields can be increased in multiples or more. This creates conditions for the single cropping system to develop towards a multiple cropping system. Our academy's rice and wheat institute worked in the fields at Changkanglong in Jiangle County continuously for 7 years since 1974 and joined the local commune members to improve the mountain ridged low yielding fields. They dug trenches and drained the water, increased the application of organic fertilizers and phosphorous and potassium fertilizers, and the yield increased in multiples from the original per mu yield of only 500 to 600 to the present yield doubling the guideline.

### (IV) Establish the Rational Agricultural Structure of Combining Agriculture, Forestry and Livestock Production Step by Step According to the Ecological Patterns

For several years following reform of the planting system in the mountain regions of northern Fujian, food grain production continued to increase and for a long time in the future, the achievements of the reform of the planting system must be fortified towards multiple cropping to increase the yield of food grains. But the phenomenon of engaging in singular endeavors for long periods is more serious. The main crop planted is still paddy rice. Forestry and animal husbandry are still subsidiary to agriculture. This is the important cause of slow agricultural development and small income of farmers. The composition of the total productive value of agriculture of the Sanming region in 1979 (Table 1) shows the agricultural economy has developed in an abnormal way. The proportion of forestry and animal husbandry is very low and this is not in line with the broad forestry base and rich grassy mountain resources in northern Fujian. Therefore, agricultural production in northern Fujian cannot be limited to the 1.61 mu of cultivated land per capita, but the view must be broadened to include the over 10 mu of forest land and grazing fields per capita. Materials and money are needed to change the structure of the agricultural economy and the structure of foods for the people.

Table 1. Total Production Value of Agriculture of the Sanming Region in 1979
Unit: Percent

| | |
|---|---|
| Total Productive Value of Agriculture | 100 |
| Agriculture | 60.66 |
| Forestry | 13.35 |
| Livestock | 8.94 |
| Sideline Production | 16.91 |
| Fishery | 0.11 |

This region is the major production region of forests for logs and forestry products. But the amount of felling surpasses the amount of production and wasteland is reclaimed for planting food grain crops everywhere. Forest vegetation is destroyed. Water and soil are lost. The natural ecological balance is destroyed, causing a vicious cycle. According to comparisons of meteorological data, before 1955, the number of occurrences of spring and summer drought in the mountain regions of northern Fujian was few but later the number increased. For example, in the two river valleys of Jianci and Shaci, the frequency of spring drought increased 20 percent, and the frequency of summer drought increased 40 percent. Pucheng County that has always been known to be the "reservoir of food grains" has suffered from frequent drought in recent years. In 1978, the entire county had 550,000 mu of rice fields, 270,000 mu suffered from drought, 80,000 mu produced no harvest. In 1979, another 90,000 mu were affected by drought, and 15,000 mu produced no harvest. In 2 years, the total drop in harvest of food grains was over 40 million jin. The damage in this county was so serious not because the water conservancy facilities were not good but because the mountain forest resources were destroyed, stream water ceased to flow, reservoirs and ponds dried up and the amount of rainfall decreased by more than 800 milligrams. Destruction of natural patterns will be punished by nature. The mountains must be green before the water can be clear, when the mountains are exhausted, the water will cease to flow. Therefore, the mountain region of northern Fujian must utilize favorable conditions, emphasize the development of forestry, hasten improvement of the proportion of forestry, and the work in the three aspects of nurturing forests, utilizing forests and protecting forests must be grasped.

Developing forestry must involve the mass production of fir, pine and bamboo and such wood forests but at the same time attention must be paid to the development of economic forests, increasing woody oil bearing plants (oil tea camellia, tung oil tree, tallow tree) and woody foods (such as Chinese chestnuts). Jiano County is a county that has planted more chestnuts. In 1978, the production constituted 29.2 percent of the total yield of the province. We surveyed the Xiashanci Brigade of the Longcun Commune. Between 13 and 15 plants were planted per mu, each plant produced 40 to 50 jin of fruits, and some produced 100 jin. Each year, each mu produced 500 to 800 jin of fruits, and the economic revenue could reach 150 to 250 yuan, equivalent to the revenue from 3 to 4 mu of mountain fields. According to information obtained from the locality, chestnut trees are an economic forest that conserves labor, fertilizers, cost and has a high income. They are all willing to plant chestnut trees. Italy developed chestnuts in the mountain regions and they provided one-third of the supply of food. If we can achieve the goal of each family planting several dozen woody food and oil bearing trees, then this will serve to solve the problems of food and oil for the people and conserve our province's cultivated land for food grains.

The proportion of livestock production in the total productive value of agriculture is very low. Compared to advanced nations, the gap is very wide. Now, in developed nations, the ratio of livestock production to the total productive value of agriculture is all above 50 percent, except for Japan which is 27 percent. The development of livestock production and its proportion in the total productive value of agriculture is an important indicator of the level of development of agriculture of a nation. For several dozen years, two new situations have occurred in the world's agricultural development. One is the close combination of planting and livestock production. The second is the quickened development of livestock production along with the increase in food grain production. In the past, we did not sufficiently emphasize the combination of agriculture and animal husbandry, and we lost out. It not only limited the diversification of the sources of people's foods but also severed the organic relationship between agriculture and livestock production, isolating the planting industry without support. Livestock production did not have a sufficient and independent source for food, and the planting sector gave more when there was more, gave less when there was less and did not give any when there was none. This forced the livestock production into a position where there were no guarantees, the production base was very weak. Therefore, in exerting great efforts to develop food grain production, the development of livestock production must be hastened simultaneously to increase the production of meats, eggs and milk to gradually change the production structure and to further change the food structure for the people. This is the important task facing our province in the agricultural frontline in the future. The ratio of food grains and meats, eggs and fish and shellfish in the diet of the Japanese people is 3.6:1. In our nation it is 11.5:1. This shows that as more meats and fish are consumed, the consumption of food grains will reduce, therefore singularly grasping food grains is unscientific. But we cannot be like Japan which depends entirely on imported feed to develop livestock production. At present, the average amount of food grains for the population of this region is 983 jin (1,118 jin in the Jianyang region, 1,014 jin in the Sanming region). The level is not high, therefore a definite area for planting feed crops must be included in the planting system to establish a stable and solid feed base, implement rational rotation planting, use agriculture to support livestock production and use livestock production to promote agriculture. If each head of hog can be given no less than one fen of land (one-tenth mu), then 10 percent of the cultivated land is needed as the basis for planting feed for hogs. With a reliable base for feed, the development of hog raising will be assured. In the production of feed, the principle of "taking green feed as the key, and rational coupling of green, coarse and fine feed" must be insisted upon. Production of green feed must be grasped at key points, such as winter astragalus, carrots, spring duckweed, summer and autumn water lettuce so that green feed is available throughout the four seasons and the supply is assured.

This region has some continuous expanses of grassy mountains and scattered grassy slopes and grasslands which can be used to raise cattle and sheep and such grazing animals in a big way. Our province is situated in the subtropics, the climate is mild, the amount of rainfall is sufficient, the regenerative strength of various kinds of grazing grasses is strong and the amount of grass produced is several times that of the northern grasslands. In spring, the percentage of covering of grassy vegetation is over 90 percent, even in the peak of winter, there is still a part of the slopes that can be used for grazing. Last year, some animal husbandry experts from the United States visited some grazing fields in our province and they praised the fields highly. They believed these grazing fields are considered good grazing fields even in the United States. In the past we talked about grasping livestock production and we only paid attention to grasping hog raising and did not give sufficient emphasis to raising cattle, sheep and rabbits. When we grasped cattle raising, we only grasped draft cattle, and neglected meat cattle. Therefore, the superior grassy mountain bases should be utilized to raise cattle, sheep and rabbits in a big way so that the grassy mountains can provide meat, milk, skin and wool. The structure of agricultural production should be gradually changed and the structure of food for the people should be changed to improve the people's livelihood and improve the physical health of the people.

There are many possibilities for sideline production in the mountain region. Mushrooms, bamboo sprouts, pine resin, medicinal herbs, palm, lotus seeds can be produced. Some mountain ridged low yielding fields, deep muddy fields that require a lot of work to improve and whose cost is high and gain is small should not be changed to rice fields without regard. Measures can be suited to local circumstances to dig them up and to build pools and ponds for raising fish. For example, the Ankou Brigade of the Shuiji Commune in Jianyang County utilized the mountain ridged fields as fishponds to raise fish. This solved the problem of fish as food for commune members and also increased the income of commune members. This is worth advocating.

### Start Out From the Actual Situation in Our Province, Increase the Degree of Agricultural Mechanization

Our province has more people and less land. The economic foundation is weak. Therefore improving the unit area yield of food grains is the major direction in our province's food grain production. Thus mechanization must be centered around increasing production in our consideration. Machinery that can only increase the labor production rate but not the unit yield can be delayed. In the mountain region, the season for seizing the double seasons is short, the labor force is concentrated, the amount of work is large, and seizing time and speed is increasing the yield of food grains, therefore mechanization of transplanting seedlings, harvesting, threshing, drying and transportation must first be solved so that it will serve well to increase the labor production rate, reduce the amount of work, shorten the time of seizing the double seasons, seize the double season late crop and increase the production of food grains. Agricultural machinery and agricultural technology must be closely coordinated and must be stabilized in relation to each other so that they can mutually promote each other and continuously improve.

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## NEW LARGE-PANICLE, LARGE-GRAIN PADDY RICE VARIETY DEVELOPED

Fuzhou FUJIAN NONGYE KESI [FUJIAN AGRICULTURAL SCIENCE AND TECHNOLOGY], in Chinese No 5, 10 Oct 80 p 61

[Article by the Food Grains and Oil Bearing Crops Research Laboratory of the Longqi Regional Agricultural Science Institute: "New Variety of Paddy Rice With Large Panicles and Large Grains--Long Guang Hong No 7"]

[Text] After hybrid paddy rice was popularized in our region in 1975, increases in yield were visible. This gave us, the breeders, a great inspiration. The reason why hybrid paddy rice can produce high yields depends on large panicles. At the same time, a method of cultivation of hybrid paddy rice is used to fully develop the superiority of large panicles to increase the yield. Practice proves that it is easier to increase the number of grains on each panicle than to increase the number of effective panicles in each mu, and the potential for increased yield is also very great. Therefore, we have determined that the key target in breeding paddy rice is to breed such characteristics as "live roots, strong stems, large panicles, large grains" to seize high yields in combination with early maturity and good resistance on the basis of a definite number of tillers. This goal of breeding will adjust the conflict between large panicles and weak tillers, large panicles and large grains, large panicles and large grains and the low degree of filling and fruiting percentage, large panicles and large leaves, and high yields and lodging. After several years of practice and exploration, parents with better affinity have been found and at present a high yield variety with large panicles and large grains called Long guang hong No 7 has been preliminarily bred successfully. This variety produced a per mu yield of 1133 jin in the early season in 1979 by propagation from the single plant. Propagation from the single plant during the late season produced a per mu yield of 1186 jin, a visible increase in yield over the original ordinary varieties.

Long guang hong is bred from the third generation offspring of the hybrid of Long fei and Guang lu ai No 4 crossed with Hong 410. In 1979, its type was determined to be an early rice variety possessing the grain shape of that of Long guang No 3, the panicle shape of that of Guang lu ai No 4, and the maturation period of Hong 410. The four major characteristics manifested are:

1. Large panicles and large grains have the potential for increased yields: The average number of grains per panicles is 120 grains, and the fruiting percentage is 85 to 90 percent. The filling is good. It produces 30 to 40 more

grains than the ordinary varieties that produce 80 to 100 grains. The thousand grain weight is 38 to 40 grams. Large panicles and large grains give each plant a large "storage" capacity and the potential for increased yield is thus also great.

2. It is an early maturing variety and it can be easily arranged: The variety has a total growth period of 125 days. There are a total of 13 leaves throughout the life of the plant. The maturation period is 3 to 4 days later than that of Hong 410. In southern Fujian, it can be sown late (10 March) to benefit winter planted crops and it can avoid "reverse spring cold." It can head during the middle 10 days of June, avoid the rainy season, fully utilize the sunlight in June and July, and it can be harvested during the middle 10 days of July without affecting the after crop.

3. The stem is short and resists lodging, advantageous to mechanized harvesting: The variety has a plant height of 91 centimeters. The stem is thick and strong. Color change is good. The number of effective panicles per mu can reach 180,000 to 200,000. The aeration in the field is good. The plants do not easily lodge, and at the same time the plants do not easily shatter, advantageous for mechanized harvesting.

4. Use of seeds is conservative: Long guang hong No 7 is sown 5 jin per mu, less than the 15 jin of seeds sown per mu of ordinary varieties. This is a saving of 2 yuan, and at the same time it is convenient for seeding and the reproduction coefficient is high.

In the cultivation of this variety, attention must be paid to: (1) sowing sparsely to cultivate strong seedlings: The early season crop can be sown between 10 March and 15 March. The seedling age is about 30 days. The plants are transplanted when there are six unopened leaves. Five jin of seeds are used per mu. The amount of seeds sown per mu in the seedbeds is 35 jin. The seedlings are cultivated in wet conditions and the seeds are sown sparsely. Triple pronged seedlings should be cultivated. Specification for transplanting the seedlings is 6 x 5. Each bunch contains two plants. The late season reverse planting in spring can be sown around 13 July. A seedling age of 18 days is sufficient. The plant must also be sown sparsely to cultivate healthy and strong seedlings.

(II) The variety is suitable for planting in fields of intermediate and high fertility. Sufficient base manure must be applied and sidedressing must be applied early. Fertilizers for the growth of panicles should be applied several times appropriately for the growth of large panicles and large grains. The boot leaf should not be allowed to grow too long. About 24 jin of nitrogen fertilizers can be applied per mu. During the latter period of growth, field management should not cut off water too early to prevent "forced maturation." General measures of cultivation can follow the methods of cultivation of hybrid paddy rice.

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## BRIEFS

**FARMING PREPARATIONS**--Fuzhou, 19 Feb (Xinhua)--As of 20 January, Guangze County in Fujian Province had accumulated 1.3 million dan of backyard manure, improved 13,000 mu of low-yield fields, ploughed 80,000 mu of farmland and afforested 22,000 mu of land. [Beijing Xinhua Domestic Service in Chinese 0151 GMT 19 Feb 81]

CSO: 4007

## BRIEFS

**PREFECTURE AGRICULTURAL PRODUCTION**--Lanzhou, 5 Feb (XINHUA)--About 90 percent of the production teams in Gansu's Wudu Prefecture have adopted the method of contracting farm work to individual households. As a result, agricultural production has swiftly gone up. In 1980, the prefecture's total grain output was 700 million jin, exceeding the previous year's record by 10 percent. The commune members' income from sideline production amounted to 91 million yuan, increasing 1.3 million yuan compared with 1979. [Beijing XINHUA Domestic Service in Chinese 0020 GMT 5 Feb 81 OW]

CSO: 4007

# PROVINCIAL STATISTICS BUREAU RELEASES INCOME FIGURES FOR PEASANTS

Guangzhou NANFANG RIBAO in Chinese 21 Jan 81 p 1

[Article: "Peasant Income in Guangdong Province Averaged More Than 250 Yuan the Year Before Last; Spirit of the Third Plenary Session of the 11th Party Central Committee Brings Peasants Visible Material Benefits; Provincial Statistics Bureau Conducts Survey of More Than 200 Peasant Households in 26 Counties, Which Confirms Improvement in Peasant Livelihood"]

[Text] Results of a recent survey conducted by the Provincial Statistics Bureau on living conditions of rural commune members in 242 households in 26 counties are as follows: Peasant income in Guangdong Province increased in 1979; household sideline occupations grew; standards of living increased; and improvement occurred in living conditions.

## Gross Income in 1979 Averaged 255.20 Yuan Per Capita For a 34.30 Yuan Increase Over the Previous Year; Net Income Was 222.70 Yuan For a 29.50 Yuan Increase Over the Previous Year

A Provincial Statistics Bureau survey of rural village commune members homes conducted in 242 households located in 26 counties shows that gross annual peasant income in 1979 averaged 255.20 yuan per capita, a 34.30 yuan increase over the previous year for a 15.5 percent increase. After deductions of production expenses for household sideline occupations and taxes, net income averaged 222.70 yuan per capita, a 29.50 yuan increase over the previous year for a 15.3 percent rise.

Of the net income, income derived from the collective amounted to 112.2 yuan, an 18.70 yuan increase over the previous year for a 19.9 percent rise. Net income from household sideline occupations was 82.2 yuan, a 5.40 yuan or 7 percent rise over the previous year. Other income amounted to 28.20 yuan, a 5.40 yuan or 23.6 percent increase over the previous year. The proportions making up net income were 50.4 percent from distributions made by the collective, 36.9 percent from household sideline occupations, and 12.7 from other sources.

The main reasons occasioning the general increase in peasant income were further implementation of the policy of distribution according to work performed, respect for the autonomy of production teams, institution of various forms of a system of responsibility for production, increases in the area of private plots, increases in state procurement prices paid for agricultural byproducts, and removal of restrictions on rural fairs, which brought about development of production and an increase in benefits.

## During 1979 Per Capita Living Expenses Averaged 205.20 Yuan, a 20.30 Yuan Over the Previous Year; Each Household Averaged 3.3 Rooms and One New Room Was Built Per Five Households

In 1979, per capita living expenses averaged 205.20 yuan, a 20.30 yuan or 10.9 percent increase over the previous year. Of the total, 122.90 yuan went for food, a 8.90 yuan increase over the previous year. Clothing took 18.90 yuan, a 0.30 yuan increase over the previous year. Fuel took 16.70 yuan, a 0.30 yuan increase over the previous year. Housing required 23.20 yuan, an 8.20 yuan increase over the previous year. Daily necessities accounted for 17.90 yuan, a 2.90 yuan increase over the previous year, and expenditures on cultural life amounted to 5.30 yuan, a decline over last year of 0.90 yuan.

Grain consumption declined from last year's average 591 jin per capita to 585 jin while consumption of several non-staple foods increased. Vegetable consumption averaged 220 jin per capita, a 1.3 jin increase over last year. Plant and animal fat consumption was 4.7 jin, a 0.60 jin increase over last year. Consumption of pork, beef, and lamb was 11.1 jin, a 1 jin increase over last year. Consumption of the three kinds of fowl was 2.80 jin, a 0.1 jin increase over last year.

Great increases occurred in the amount of ownership of four categories of expensive goods. Bicycles averaged 76 per 100 households, a 21.1 increase in the number since the previous year. There are 27.3 sewing machines per 100 households, an increase of 7.1 machines over the previous year. Radios per hundred households numbered 42.6 sets, an increase of 11.2 sets over the previous year. Every 100 households had 45 wristwatches, a 19.4 increase over the previous year. Some of the expensive merchandise was gifts from relatives and friends in Hong Kong, Macao, and foreign countries.

In 1979, each household averaged 3.3 rooms, a 3.1 percent increase over the previous year, and 1 new room was built for every 5 households. Each room was built at an average cost of 484.50 yuan, a 71.8 percent increase over the previous year. Expenditures for newly built houses averaged 82.3 yuan per household, an 87.2 percent increase over the previous year.

## Several Problems Reflected in the Survey

Of the 1979 average per capita increases in net income, increase from an increase in price (both list price and negotiated price) paid for agricultural byproducts accounts for 28.9 percent and increased income from production accounted for 71.1 percent, which is to say that almost one-third of net income increases derived from increases in prices.

Once commune member family sideline occupations revived and developed, income derived from the growth of household sideline occupations averaged 10.20 yuan per capita; however, production costs and taxes amounted to 4.80 yuan, so real gains were not great.

Income levels for some commune members are still very low. Of the 240 households surveyed, 11 of them or 5 percent had per capita net incomes below 100 yuan.

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CSO: 4007

## GUANGDONG

# QUESTIONS ON CONTRACTS FOR SPECIALIZED PRODUCTION ANSWERED

Guangzhou NANFANG RIBAO in Chinese 8 Jan 81 p 2

[Article: "Provincial Agricultural Committee Responds to Reporter's Questions on Specialized Trades Contract System of Job Responsibility"]

[Text] For the past 2 years, a group of production brigades in the farming villages of our province have set up a system of job responsibility for specialized trades contracting with payments calculations tied to production. There is practical proof that this type of responsibility system is more advantageous when compared to other forms of contract production and is more favored by commune members. Recently, on a visit to the Provincial Agricultural Committee, a reporter from this newspaper asked questions based on letters from the masses concerning this type of job responsibility system. Their answers are now provided below:

Q. What is the "system of job responsibility for specialized trades contracting with payment calculation tied to production?"

A. "This is a production system whereby production is guaranteed on a basis of division of work done in specialized trades, tied to rewards calculated from production output." (A brief description of the specialized trades contracting job responsibility system follows.)

This type of job responsibility system involves cooperative division of work under the conditions of unified management of production brigades. There are various contracts let in agricultural, forestry, livestock, sideline, fishery and industrial-commercial occupations based on the special skills and the level of capability of each able-bodied worker. On the principle of that which is convenient to production and beneficial to management, contracts are let to various specialized trades groups, households and workers, with each operational item in the course of production being unified when feasible or being divided when feasible. That portion under contract is assigned to production brigades for unified assignment, with over-production bonuses or under-production penalties being handled accordingly. Fixed in the form of contracts this will be unchangeable for the current year or for a period of several years. The specialized trades contracting method is essentially similar to other job responsibility systems with calculation of payments tied to production, in that production brigades sign "fixed quantity" contracts with groups, households and workers, for instance, provide for specified production output or output value, specified production expenditures, specified work point payment amounts and specified bonus-penalty procedures. Because the levels of production and of administration, as well as the masses' customs are different at various places, the concrete aspects of contracting procedures are quite diverse, and must be devised in line with local conditions and specialized trades, and formulated through democratic consultation.

Q. What are the differences between this system and other forms of production contracting?

A. "This system was developed on a foundation built from summarizing other forms of production contracting. It retains the advantages of payment calculations tied to production possessed by various forms of production contracting, and further was developed into one which had the new characteristic of contract production through sharing of work in specialized trades under unified management by production brigades."

Because of this, all forms of production contracting not incorporating this new characteristic are unable to be known as "specialized trades contracting job responsibility systems." For example, there are several production brigades which employ fixed-production or fixed-task contracts made with households and which base contracted allocations of cultivated land for each family or household on the number of people or on the amount of (each person's) grain ration. Each production project of the production brigades is contracted on the basis of the average number of people involved, without application of the special characteristic of "work sharing among specialized trades under unified management." They are thus unable to be called "specialized trades contracting job responsibility systems." Some people confuse the specialized trades contracting job responsibility system's "fixed-production or fixed-task contract with specialized trades households" with the abovementioned "fixed-production contract with households." This is incorrect, because the former is production contracting on the basis of specialized trades work sharing and the latter uses the per capita approach of "small yet undivided" production contracting. There are obvious differences between the two.

Q. When can a production brigade be considered to be effecting the specialized trades contracting job responsibility system?

A. "At present there are numerous production brigades which are effecting many forms of production contracting. Some production projects employ specialized trades contracting, some employ contracting production with the labor (force) or with households. Under these circumstances, different opinions have emerged as to how to determine which job responsibility system some particular brigade is actually effecting. Some people believe that so long as paddy rice production is contracted with specialized trades the entire brigade can be considered as effecting the specialized trades contracting job responsibility system. Some people believe that so long as all of production is carried out according to specialized trades contracting the entire brigade can be considered as effecting this system. Neither of these two ways of viewing the question are sufficiently thorough. In order to define the nature of a production brigade's job responsibility system, one must set forth from the overall aspect of the brigade as a whole, and ascertain which procedure is employed in those tasks which predominate in their production operations. It is quite obvious that for production brigades in different locations the predominant production tasks will also be different. In grain-producing areas, grain production occupies the predominant position; in forestry and fishery areas and where there is centralized production of industrial crops, the predominant operations are related to forestry, fishery and industrial crops. No matter what kind of production brigade it is, or how many production tasks it has, so long as in its predominant production tasks it employs specialized trades contracting it should be said to be effecting the specialized trades contracting job responsibility system. For example, there are several production brigades in suburban areas of cities where vegetables and industrial sideline occupations occupy predominant positions and moreover they are employing specialized-trades contracting. Even though their paddy rice might be contracted to households they should likewise be said to be effecting this specialized-trades contracting system. In short, we must set forth from the real situation, allow a production brigade to simultaneously employ different management styles, different labor organizations and different procedures for calculating payments. That is to say, the nature of a production job responsibility system must be determined on the basis of the principles explained above, it must be acknowledged that there can be single-task specialized trades contracting, and that this must be made to gradually develop into comapratively integrated specialized-trades contracting. To require that every task of production brigades be immediately effected with specialized-trades contracting is unrealistic.

Q. What advantages are there to the specialized trades contracting job responsibility system?

A. They are chiefly the following aspects:

"First, it can fulfill the requirements of the commune members that payments be calculated by tie-in to production, can stabilize the position of the production brigade as the main economic body, and can integrate the mobilization of the enthusiasm of individual commune members with the advantages of bringing unified management into full play and sharing out the work in cooperation with one another."

For the past 2 years, in order to overcome equalitarianism in assignments, commune members at many locations requested that payment calculations be tied to production and furthermore attempted to devise many methods to use in contracting production. However, there were several forms of production contracting centered on individual management which, although comparatively successful at mobilizing the enthusiasm of commune members, nevertheless made difficult the bringing into full play the advantage of unified management, were handled poorly, and were even capable of weakening the collective economy. But effecting the specialized trades contracting system not only unifies management but brings sharing out of work in cooperation with one [illegible]; it not only brings into play the advantages of the collective but moreover [illegible] the enthusiasm of each individual; not only is the income of the individual increased but moreover the collective economy is continuously made to grow in strength and stability.

"Second, the system closely integrates the resources of manpower, materials and soil fertility to achieve the best possible use of men, land and materials. It brings into full play the superiority of local areas and local units and develops a diversified economy, promotes commodity production, and accelerates the pace by which poverty is converted to prosperity."

There is a great body of facts which clearly shows that, by effecting specialized trades work sharing for production contracting, labor results are raised and it is possible to wrest even greater labor power out for opening up new avenues for production. Also, even more agricultural by-products are produced to be put in the marketplace to satisfy the livelihood and industrial production needs of the people in the city and country alike. It particularly facilitates the utilization of labor power on the basis of skills and among the group each has a role to play, can master specialized trades techniques and promote scientific planting to impel agricultural production to develop in the direction of socialist specialized trades with work sharing.

"Third, it is beneficial to the looking after of household sideline production by commune members and facilitates arrangements in the areas of production and livelihood in the cases of households with four members [0934 1466 1437] or deficient in labor power."

When production is contracted according to specialized trades, responsibilities are clearly defined and on the initiative of the commune members it is possible for there to be flexible arrangements for household sideline industry production. Particularly in the case of those households where there are four members or where the labor power is halved it is possible to participate in specialized trades contracting on the basis of one's own speciality and capability in order to increase income and lighten the burden of the collective.

Q. What problems should be considered when effecting a specialized trades contracting job responsibility system?

A. "First, the point of departure must be the real situation, measures must be suited to local conditions and direction divided categorically."

There are many advantages to the specialized trades contracting job responsibility system. The range of its adaptability is fairly wide, and it should be fully approved and enthusiastically advocated. However the steps taken to put it into effect and to popularize it should be reliable. There cannot be any copying mechanically in disregard of specific conditions. The sword when wielded should not be swung too urgently; nor should everyone rush headlong into mass action. People must set forth from the levels of production and administration of the local units and on a foundation formed by the free will of the masses, go through the "test points," proceed from the details to the overall aspect, divide direction categorically, and promote the system gradually. Practice has proven that in those production brigades where diversified economy is fairly good and where the levels of production and administration are fairly high, acceptance of this system by the cadres and masses is facilitated and promotion on a general level is possible. In those impoverished brigades effecting production contracting with households it is fairly difficult to immediately put into effect specialized trades contracting and thus attention must be paid to retaining those collective production projects which are economically successful, strengthening and advancing them by adopting the style of specialized trades contracting. At the same time people should exert efforts to open up new avenues for collective production, strengthen collective economy, and create conditions which will result in each production project of the production brigades gradually turning in the direction of, and advancing toward, specialized trades contracting. As for those production brigades with collective economy bases and which engage in production contracting with households although they do not need to do so, even more enthusiasm should be applied to leading them to putting the specialized trades contracting job responsibility system into effect. "Secondly, leadership should be strengthened. Not only should the use of economic methods in leading production be mastered but also the political work of strengthening ideology should be mastered."

Some people suppose that after specialized trades contracting is put into effect, nothing else can be contracted and cadres in commune units no longer have any worthwhile work to do. This is a misunderstanding. The truth is to the contrary since the specialized trades contracting system requires that commune unit cadres go a step farther in strengthening leadership before the system can be successfully implemented and popularized. On the one hand, great efforts must be made in training the cadres in advancing the level of economic administration and properly maintaining the relationship between the various specialized trades groups, households and workers. This is particularly so where specialized trades contracting projects are comparatively numerous, where production conditions are different among the various trades, and dissimilar prices result from the use of different specialized trades labor practices. When the daily value of most industrial sidelines contracting is comparatively high, and the daily value of agricultural labor contracting low, conflicts easily arise and equalizing work must be carried out in the links of specified production, specified work, and specified awards and penalties. On the other hand, ideological questions which are manifested in the course of putting the specialized trades contracting system into effect should be countered; education in patriotism, pro-collectivism and in pro-unity and pro-mutual assistance should be intensified to bring about strict implementation of contracting agreements by all with everyone consciously supporting a collectivized economy and determinedly completing the nation's mission.

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# GUANGDONG

## CROP DISTRIBUTION, READJUSTMENT DISCUSSED

Guangzhou NANFANG RIBAO in Chinese 23 Jan 81 p 2

[Article by Lin Guoxiong [2651 0948 7160], Provincial Agricultural Commission: "Problems To Be Heeded in Readjusting the Agricultural Cropping Pattern"]

[Text] Ever since the Third Plenary Session of the 11th Party Central Committee, Guangdong Province has reaped very good economic benefits from the implementation everywhere of the two Central Committee documents on the development of agriculture, making the most of advantages, emphasizing long points and eschewing shortcomings, adapting general methods to specific situations, making appropriate readjustments in the pattern of agricultural crops, converting to the growing of economic crops of some land not suited to the growing of grain, or retrenching cultivated land for conversion to the fishing industry or to forestry. In Doumen County on the Pearl River Delta, for instance, a fine cycle has been established in the course of the last two years that combines improvements in low-lying sandy fields and the conversion of some of the low-lying fields to fishponds at the base of which sugarcane is grown and above which pigs are raised, with the pig dung being used to feed the fish, and the pond mud being used to fertilize the fields. Despite a decrease in the ricefield area by 15,000 mu (5.2 percent of the total ricefield area), thanks to an increase in per unit yields, a 10,200 mu expansion in the sugarcane area, and a 5000 mu enlargement of fishponds, an overall increase in output of grain, sugarcane, fish, and pork has resulted. During the past 2 years, paddy rice output has increased by 57.55 million jin, sugarcane by 168,000 tons, pondfish by 11,900 dan, and the quantity of live hogs sent to market has increased by 62,000 head. Distributions from the collective have increased from an average 83.30 yuan per capita to 165 yuan. In the readjustment of its cropping pattern during the past 2 years, Huiyang Prefecture has given attention to the rotational cropping of peanuts, soybeans, and paddy rice to achieve bumper harvests in both grain and edible oil. Even though the paddy rice area was reduced by 310,000 mu, as a result of increased per unit yields, total output increased by 228.54 million jin. Through the expansion of peanut growing on 270,000 mu of paddyfields, total output increased by 69.3 percent. As a result of the expansion of the soybean area by 140,000 mu, total output increased 85 percent.

Nevertheless, there is another side that must be looked at. Ours is a province in which large numbers of people depend on a small amount of cultivated land where the cultivated area averages only 0.86 mu per person. In addition, damage to agricultural production from natural causes is substantial; output is not sufficiently consistent, and grain is always in fairly short supply. The grain growing area cannot be reduced without control or else sustained growth in grain output will be impaired causing all economic activity to sink into a passive situation. During the past 2 years the area planted to grain throughout the province has been reduced by more than 8.2 million mu (more than 2.7 million mu of it in rice growing area), and though an overwhelming majority of these adjustments have been called for, there can be no future large scale readjustments each year such as have occurred during the past 2 years. In order to maintain increases in grain output, generally there should be no further reduction in the area sown this year to early and late crop rice. We must continue to hold grain production firmly in hand, and we positively cannot take it lightly. Of course, we cannot be "arbitrary" either. In a small number of areas where readjustment is truly needed, further emancipation of thoughts must be done and sensible arrangements made. However, any reduction in the area in which grain is grown must be made up by increase in per unit output in order to assure continued increases in total grain output. In Guangdong Province, early and late crop rice is sown over a vast area, and a great potential for increased output exists. First of all, we must concentrate our efforts on these two crops of rice, so that even if there is a shortfall in grain from the winter planting, it can be easily made up.

Development of economic crops in Guangdong Province will depend primarily on vigorous increases in output per unit of area; no further grain fields can be used for this purpose. The potential is very great in this regard. In the case of sugarcane, for example, during 1963 it was grown on 1.32 million mu throughout the province and yields averaged 3.71 ton per mu, while in 1979, yields averaged only 3 ton per mu, and in 1980, they were only about 3.3 tons, not yet back up to the highest recorded level. If only a system of responsibility for production is enhanced and perfected, and water and fertilizer management intensified, striking increases in per unit yields will be possible. Average per unit yields are not high for peanuts, jute and bluish dogbane [Apocynum venetum], silkworms, tea, or fruit. If policies are put into effect and vigorous action taken, increases in per unit yields will have bright prospects.

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# RESISTANCE TO COLD, DISEASE, INSECTS IN RICE DISCUSSED

Guangzhou NANFANG RIBAO in Chinese 8 Jan 81 p 4

[Article by Huang Yaozhong [7806 5069 0022]: "Need to Give Serious Attention to Breeding of Rice Varieties With Multiple Resistance"]

[Text] One important reason why Guangdong's rice output is neither high nor consistent is the poor resistance of varieties. Exposure to disease, insect pests, cold, or waterlogging readily leads to a fall in output. The principal methods currently being used for prevention and control such as chemical control and biological prevention have their limitations. Therefore, some highly effective, safe, and economical method of prevention and control must be found so that damage from diseases and insect pests creates no further economic damage, and both high and consistent output of rice will be assured.

Since the 1960's, numerous countries in the world have made the breeding of disease and insect pest resistant varieties a main objective in preparing breeding plans. More than one quarter of the crop area for grass family and pulse family crops in the Soviet Union is devoted to disease resistant varieties. In Japan, West Germany, and the United Kingdom, the area of disease resistant varieties of major crops has been increased. Because of the use in the United States of varieties resistant to the European corn borer, losses have fallen by 300 jin per mu at an annual saving in pesticides of 21,000 tons. The area of insect resistant corn varieties has spread to 130 million mu. China has also done some work in this field. During the past several years, the Hunan Academy of Agricultural Sciences has selected some disease and insect resistant varieties that are resistant to bacterial blight and to leaf hoppers such as Xiangyin 32 and 98. In experimental use, with no pesticides or less use of pesticides, disease and insect pest infestations were very light, and around 100 jin per mu more of paddy rice was harvested while expenses for pesticides dropped by 94 percent. Results have been obtained in Guangdong Province through the use of zhaiyeqing [4504 5509 7230] varieties in the control of blast of rice, and baotaixuelu [0545 5158 5877 4845] varieties have shown fairly strong resistance to leaf hoppers and bacterial blight in rice. Consequently, for many years they have been the major late rice varieties used in Guangdong. According to reports from Shaoguan Prefecture, hybrid rices Shanyou 6 and Weiyou 6 also show fairly good resistance to the aforementioned diseases and insect pests. In the breeding of resistant varieties in Guangdong Province, however, the two kinds of problems discussed below exist.

(1) The goal in the breeding of rice varieties usually emphasizes bumper output to the neglect of resistance. Many new varieties possess quite good bumper output qualities, but their resistance is poor; consequently when environmental conditions favor growth of diseases and insect pests, output may suffer. The rice variety now being promoted in Guangdong Province, Guizhao, for example, is a high output variety, but it is prone to blast and bacterial blight infection.

(2) Homogenization of varieties. In quite a few prefectures in Guangdong Province no heed is given the mixing of varieties. As soon as a fairly good variety appears, it is continuously planted over wide areas providing insects with abundant food and conditions for gradual adaptation, making it easy for diseases and insect pests to grow and spread in large numbers, and some new varieties that possessed resistance at the outset, lose that resistance in production after 3 or 4 years of growing.

In order to do something about the aforementioned problems, it is suggested that the agricultural and scientific authorities concerned take action to bring about a solution in the shortest possible time. First of all breeding of rice varieties with multiple resistance should be made a major task for scientific research in Guangdong Province. Standards for evaluating and rewarding achievements in the breeding of rice should be improved upon to make resistance to disease and insect pests a major criterion in evaluation and approval. Appraisal of existing varieties and research in the breeding of new varieties should now be launched for resistance to rice blast, bacterial blight, rice leaf hoppers, and rice gall flies. Secondly, since resistance breeding involves a broad area and requires a great amount of work, experts from many disciplines such as breeding, genetics, plant pathology, entomology, and biochemistry should be organized for a cooperative division of labor so as to avoid duplication and dispersal of forces for research. Authorities concerned should provide required research conditions to assure the smooth progress of this research. At the same time, there should be an active collection and appraisal of the resistance of existing varieties with emphasis on the bacterial strains of the pathogenic bacteria and the distribution of physiologic forms and their pathenogenesis; study of the biological types of insects and their degrees of damage, coupled with study of the resistance mechanism and genetic laws of rice varieties that are resistant to diseases and insect pests. Furthermore, in the promotion of varieties resistant to diseases and insect pests, a system of rotation of a mixture of varieties should be used. There should be no homogenization or continuous planting of the same variety as the early crop. For each crop, at least two or three varieties should be planted, and in places where conditions permit, varieties should be changed every 3 or 4 years so as to extend the time of use of resistant varieties.

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# GAZHOU COUNTY PROMOTES SCIENTIFIC FARMING, OUTPUT INCREASED

Guangzhou NANFANG RIBAO in Chinese 24 Dec 80 p 1

[Article: "Rice Output Up By More Than 10 Percent in Gaozhou County This Year; Farming Relies on Science and Superior Varieties Win Honors"]

[Text] Gaozhou County has further increased its level of scientific farming through large area promotion of hybrid rice varieties and of "Guichao." This year's gross output of paddy increased by more than 77.9 million jin over last year's output, which was the highest ever recorded, for a 11.5 percent increase. Yields averaged 1,377 jin per mu, a 158 jin per mu increase.

This year's early crop was much damaged by typhoons, and the late crop suffered from autumn drought. Nevertheless since Gaozhou had promoted wide area planting of superior varieties, it was able to increase output greatly despite unfavorable conditions. Early crop planting of "Guichao No 2" brought yields averaging 760 jin per mu, and "Shanyou No 2," and "Shanyou No 6" averaged 880 jin per mu, while yields from conventional varieties were less than 600 jin.

As a result of the drought that afflicted the late crop, the fruiting rate for conventional varieties was far from ideal. Output was only normal or less, while on the more than 130,000 mu of hybrid rice, yields averaged more than 830 jin per mu, the late crop once again winning honors with an increase in output of more than 26 million jin.

A great amount of work was required in the large area promotion of superior varieties in Gaozhou. First of all was attention to seed preparation. Twenty-three of the 27 communes in the county went in for hybrid rice seed propagation on a seed propagation area of more than 14,000 mu to propagate a total of more than 1.81 million jin of seeds. In addition to supplying the county's own needs, some were shipped to other counties. Second was vigorous training of high output planting technicians. A total of more than 45,000 county, commune, and production brigade cadres and commune members participated in training classes in planting techniques for hybrid rice and Guichao superior variety, laying a good foundation for wide area promotion of superior varieties. Third, scientific research technicians did a good job of surveying and studying to uncover problems in time and give overall guidance.

Gaozhou County is a high output county in Zhanjiang Prefecture, and its level of farming techniques is fairly high. In 1979, single crop yields averaged 1,232 jin per mu, and both total output and per unit yields were more than 10 percent higher than the previous year.

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CSO: 4007

# BREEDING EARLY MATURING PADDY RICE PRODUCES BUMPER HARVESTS

Guangzhou GUANGDONG NONGYE KEXUE [GUANGDONG AGRICULTURAL SCIENCES] in Chinese No 2, 8 Mar 80 pp 22-26

[Article by the Ordinary Breeding Group of the Huiyang Regional Agricultural Science Institute*: "Preliminary Summary of Breeding Early Maturing Paddy Rice"]

[Text] Cultivating and propagating superior varieties of paddy rice that are early maturing, that can produce bumper harvests and that have a strong resistance to adversity are effective measures for our region's rice crops to avoid disasters and to develop their advantages and to produce high and stable yields.

After our institute successfully bred the extra early maturing variety "Qing xiao jin zao" early rice in 1960, we continued to successfully breed the extra early maturing and early maturing varieties "San qi zao," "Tang quan zao," "Hui ke shi" early rice. After 1973, we continued to successfully breed the early maturing varieties "Guang er xuan san," "Han lu zao," "Guang er xuan si" of rice for the late crop. All of these varieties have been used in production, and among them, "Qing xiao jin zao" was once propagated in our province and outside of our province. Its area reached several million mu. It has served importantly as an early rice crop that avoided flood waters and damage by the second generation rice stem borers and as a crop that utilized the seedbeds of the late crop to produce an additional harvest of rice. It has also been used by some scientific agricultural research units as a parental source for early maturity and some early maturing superior varieties for the early crop have been successfully bred from it.

It is generally believed that the yield of early maturing varieties is always less than the yields of intermediate and late maturing varieties, but practice proves that under appropriate cultivation conditions, early maturing varieties can similarly produce high and stable yields. Our institute conducted comparative experiments of early rice varieties from 1973 to 1979. The results show that under basically the same cultivation conditions, the early maturing variety "Guang lu ai No 4" that has a growth period of 114 days produced more per mu for 3 years than the intermediate maturing variety "Zhen zhu ai" that has a total growth period of 126 days. The average per mu yield of 7 years of comparative experiments of varieties was 638.47 and 669.25 jin, the yield of "Guang lu ai No 4" over the 7 years all far surpassed "Zhen zhu ai." Because the latter growth period of early maturing varieties of early rice is still in a meteorological environment in which the difference between the daytime and nighttime temperatures is relatively large, there is more accumulation of photosynthetic products, the percentage of panicle formation and the fruiting percentage are higher and the thousand grain weight is heavier. Thus, when the amount of base manure is sufficient, when management is timely, the yield of early maturing varieties with short panicles and few grains can approach or surpass the yield of intermediate maturing varieties with long panicles and many grains under such conditions of cultivation, regardless whether they are planted in experimental fields or in productive fields.

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As to the late crop, because the cold dew winds affect the heading and fruiting of late maturing varieties, frequently, under the same conditions, the yield of early and intermediate maturing varieties approach or even surpass the yield of late maturing varieties. For example, our institute selected from the major late maturing variety "Guang er xuan er" used as the late crop the variety "Guang er xuan san" which matured about 10 days earlier than the original variety. After many years of comparison of the yields, the yield was about the same as that of the original variety. It can be seen that under definite conditions and within a definite maturation period, late maturing varieties with a long growth period do not necessarily produce a higher yield than early maturing varieties with a short growth period. Selective breeding of early maturing high yielding varieties has broad meaning.

Because the low temperatures and overcast and rainy weather during the early crop period in our region do not end until the end of February in the southern counties and the first 10 days of March in the northern counties, the problem of rotting seedlings of early sown plants has still not been solved very well. After June, rains brought on by typhoons occur frequently, hindering fruiting of paddy rice and causing the plants to lodge and affect the harvest. Considering the aspect of avoiding disasters and developing the advantages, it is necessary to selectively breed varieties with a short growth period (the entire growth period should be 100 to 110 days) and which can be appropriate sown late and which can also safely mature and be harvested before the arrival of the typhoons and the overcast and rainy season. For the late crop, varieties with a growth period of 135 days should be selectively bred so that the crop can head fully before the last 10 days of September in the normal transplanting season, thus avoiding the cold dew winds.

Concerning the Method of Selective Breeding Paddy Rice Varieties That "Mature Early, That Produce Bumper Harvets, That Resist Adversities," We Have the Following Experience:

(I) "Select the early maturing varieties from the superior varieties," systematically select and breed new early maturing varieties from among intermediate and late maturing popular varieties with good comprehensive characteristics.

It is generally believed that the early maturing characteristics of paddy rice is a quantitative characteristic controlled by several recessive genes. In the colonies of paddy rice varieties, mutant individuals that mature earlier than the normal maturation period of the original variety are frequently separated out by mutation of natural hybridization. These early maturing mutant individuals have already become pure by the time they are bred artificially. After propagation or a short period of selective breeding, their characteristics become fixed and their yields can be evaluated. Therefore using the line selection method to selectively breed early maturing varieties from among existing intermediate and late maturing varieties will produce quick results. The first extra early maturing short stemmed variety "Qing xiao jin zao" for the early crop selectively bred by our institute was successfully bred by the line selection method. In addition, we also selected the new variety "Hui ke xuan 1" from "IR22." The new variety matures 10 days earlier than the original variety and retains the good plant type and resistance of the original variety. We selected the new variety "Ke qing" from "Ke 10." The new variety matures 20 days earlier than the original variety and retains the high yielding characteristics of the original variety. We selected "Guang er xuan 3" from major late maturing variety "Guang er xuan 2" of the late crop. The new variety matures about 10 days earlier than the original variety. Then from "Guang er xuan 3" we selected "Han lu zao" which matures about 7 days earlier, and we selected the "Guang er xuan 4" which is an extra early maturing late crop variety whose entire growth period is only 115 days. After a series of selective breedings, we believe, it is entirely possible to use the line selection method to select from an intermediate and late maturing variety a new variety that matures 7 to 10 days earlier but possesses other major characteristics and the yield does not differ too much. Whether the early maturing new varieties bred from line selection can be popularized in production depends to a large degree on two conditions. One is that the original variety should have good comprehensive characteristics. The original variety should be a locally propagated variety with a wide adaptability. The early maturing plant line selected must have an earlier maturation date and the other characteristics should all be similar to the original variety. The second is that many early maturing mutant plant lines should be selected from one superior variety, then the superior plant line is selected by comparing the plant lines to avoid nonhereditary mutation caused by the effects of the environment of cultivation, error in selection or mechanical mixing, thus in turn affecting the results of selection. Our institute selected 220 early maturing plant (panicle) lines from the major late maturing variety of the late crop "Guang er xuan er," and after repeated indoor selection of the plant lines for comparison, we selected one plant line "Guang er xuan 3," which retains the superior characteristics the amount of yield and the resistance of the original variety, but with a growth period which is shorter by 10 days. Now it has been propagated over large areas in our region.

(II) Emphasizing selective combination of the early maturing parents and the selection of the hybrid offspring.

Our institute frequently used "Tang quan zao," "Qing xiao jin zao," "Er jiu qing," "Hui ke shi," "Guang lu ai No 4" varieties as the early maturing parents of early rice. When these early maturing parental varieties are crossed with various intermediate and late maturing varieties, a definite number of early maturing single plants can be separated out from the $F_2$ generation. But, different early maturing parents, or coupling different intermediate and late maturing parents with the same early maturing parent, or pedigree crossing and back crossing one early maturing parent will produce hybrid offspring of different manifestations. During the early crop of 1979 we surveyed the separation of the maturation times of $F_2$ of 8 combinations (Table 1). In the table, combination 1 to combination 4 show that using different early maturing parents to cross with the same intermediate maturing parent, the percentages of early maturing $F_2$ plants differ greatly. Combinations using "Tang quan zao" as the early maturing parent produce more early maturing $F_2$ plants than combinations using "Hui ke shi" or "Qing xiao jin zao" as the early maturing parent. It can be seen from conbination 2 and combination 7 that when "Hui ke shi" is used as the early maturing parent coupled with the late maturing variety "760209," the number of early maturing $F_2$ plants constitutes only 3.5 percent but when coupled with the intermediate maturing variety "IR28," the number of early maturing plants reached 28.8 percent. Combinations 5 and combination 6 show that even when the two parents of the hybrid combinations are the same, pedigree crossing and back crossing produce different results. When the early maturing variety "Guang ly ai No 4" is used as the female, the number of early maturing $F_2$ plants constitutes 8 percent, but when the late maturing variety "760209" is used as the female, the number of early maturing $F_2$ plants constitutes only 3 percent.

According to the demands of "early maturity, bumper harvests and resistance to adversity," selecting early maturing single plants with good plant type and color of maturation, plenty of effective panicles, large panicles, good fruiting percentages and less affected by diseases and insects as the chosen plants and selecting several combinations with the same intermediate maturing parents from the $F_2$ generation show that the percentage of plants chosen from the $F_2$ generation having the early maturing variety "Tang quan zao" as the parent is higher while the percentage of plants chosen from the $F_2$ generation having "Er jiu qing" and "Qing xiao jin zao" as parents is lower, according to the percentages of chosen plants of the $F_2$ generation of the five frequently used early maturing parent varieties tabulated by this institute (Table 2). The early maturing plants of the $F_2$ generation of combinations with a low percentage of chosen plants all possess some unfavorable characteristics that are very difficult to avoid. For example, the hybrid offspring of "er jiu qing" have small panicles and are easily affected by disease, the hybrid offspring of "Qing xiao jin zao" have a loose plant type and the leaves are wide and long.

Using the five early maturing parents such as "Tang quan zao" coupled with some intermediate maturing parents shows that the percentage of plants chosen from the hybrid $F_2$ generation of the combinations between the early maturing parent such as "Tang quan zao" and intermediate and late maturing varieties "Ai ji dui

Table 1. Statistics of the Separation of the Maturation Dates of the $F_2$ of Different Combinations Early Crop of 1979

| Number of the Combination | Name of the combination | Earlier than the early maturing plant | | Mature at the same time as the early maturing parent | | Mature between the maturation times of the parents | | Mature at the same time as the late maturing parent | | Mature later than the late maturing parent | | Total No Surveyed (plant) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No. | Percent | No. | Percent | No. | Percent | No. | Percent | No. | Percent | | |
| 1 | Tang quan zao x IR28 | 1 | 0.5 | 66 | 33.0 | 20 | 10.0 | 108 | 54.0 | 5 | 2.5 | 200 | |
| 2 | Hui ke shi x IR28 | 6 | 3.0 | 50 | 25.0 | 60 | 30.0 | 71 | 35.5 | 13 | 6.5 | 200 | One plant of the early crop does not head |
| 3 | Tang quan zao x tie gu zhong | 2 | 1.0 | 90 | 45.0 | 84 | 42.0 | 24 | 12.0 | 0 | 0 | 200 | |
| 4 | Xiao jin zao x tie gu zhong | 2 | 1.0 | 26 | 13.0 | 156 | 78.0 | 6 | 3.0 | 10 | 5.0 | 200 | |
| 5 | 760209 x guang lu ai No 4 | 1 | 0.5 | 5 | 2.5 | 128 | 64.0 | 43 | 21.5 | 23 | 11.5 | 200 | Two plants of the early crop do not head |
| 6 | Guang lu ai No 4 x 760209 | 0 | 0 | 16 | 8.0 | 130 | 65.0 | 40 | 20.0 | 14 | 7.0 | 200 | Three plants of the early crop do not head |
| 7 | Hui ke shi x 760209 | 1 | 0.5 | 6 | 3.0 | 163 | 81.5 | 22 | 11.0 | 8 | 4.0 | 200 | One plant of the early crop does not head |
| 8 | Er jiu qing x guang chang No 13 | 2 | 1.0 | 31 | 15.5 | 108 | 54.0 | 57 | 28.5 | 2 | 1.0 | 200 | |

Note: Because the seedling period was longer due to early sowing and the numerous days of overcast and rain during the period of the experiments, the number of days of growth of the parents participating in the experiments were more than ordinary years. One hundred plants of each variety were surveyed and their total number of days of growth is listed below:

| | | | | | |
|---|---|---|---|---|---|
| "Xiao jin zao" | 114-118 days | "Tang quan zao" | 115-125 days | "Guang lu ai No 4" | 117-124 days |
| "Er jiu qing" | 114-119 days | "Hui ke shi" | 118-124 days | "IR 28" | 127-134 days |
| "Tie gu zhong" | 130-134 days | "Guang chang No 13" | 127-133 days | | |

"760209" (Introduced from the International Paddy Rice Institute, its parental combination is "IR24" x "TKM 6") 141-150 days

Table 2. Statistics on Utilization of Frequently Used Early Maturing Parents Early Crop of 1979

| Name of Early Maturing Parent | Total Number of Plants Selected | Early Maturing Plants Selected No. of Plants | Percent | Intermediate Maturing Plants Selected No. | Percent | Total Number of Plants Selected No. | Percent |
|---|---|---|---|---|---|---|---|
| Tang quan zao | 22,484 | 112 | 0.50 | 73 | 0.32 | 185 | 0.82 |
| Hui ke shi | 43,004 | 413 | 0.26 | 130 | 0.30 | 243 | 0.56 |
| Guang lu ai No 4 | 10,890 | 46 | 0.42 | 39 | 0.16 | 85 | 0.58 |
| Qing xiao jin zao | 17,125 | 42 | 0.25 | 18 | 0.11 | 60 | 0.36 |
| Er jiu qing | 8,112 | 14 | 0.17 | 0 | 0 | 14 | 0.17 |

lun," "IR28," "760209" and "Za 9" that have short stems, good plant type, strong resistance and strong tillering strength is higher, but it is difficult to select early maturing single plants that have a good plant type and many panicles from the $F_2$ generation of combinations using locally bred varieties "Zhe nong 3288," "Zhen zhu zao," "Sheng li xian," "Jia qing zao" that have tall stems, relatively weak tillering strength and wide leaves, according to the statistics of the single plants chosen from the $F_2$ generation based on the above standards (Table 3).

A preliminary survey of the hybrid combinations bred for early maturity for use as the late crop shows more superior single plants and plant lines that satisfy the demands of "early maturity, bumper harvests and resistance to adversity" have emerged in the hybrid offspring of such varieties as "Guang er xuan san" and "Guang er xuan si" (early maturing, extra early maturing, tall stemmed, having good resistance, high fruiting percentage and wide adaptability) as parents crossed with "Za 9" (a variety having a short stem, plenty of panicles, good plant type, a high fruiting percentage) bred from "Zhai ye qing" x "Xiao jia huo" by our institute, "Hui qiu ai" (an extra early maturing variety that has plenty of panicles and short stem bred for the late crop through complex hybridization by our institute using the four varieties "Gou lian zhong," "Ai jiao gao liang," "Shu ya zhan," "Guang qiu ai" as parents), and "Zao zhong shan."

The selection of hybrid offspring should not only follow the standard characteristics of "early maturity, bumper harvest, resistance to adversity" but we must also pay attention to selecting early maturing plant lines that grow early and develop quickly, that have good prosperous growth and whose tillers and plant height can increase rapidly. Because the vegetative growth period of early maturing varieties is short, there must be a definite amount of growth during the early period so that the panicle heads will not be too small, otherwise affecting the yield. At the same time, only early growth and rapid

Table 3. Utilization of Coupled Parent of Intermediate and Late Maturation and Early Maturing Parent Early Crop of 1979

| Name of Parent | Total No. of Plants of $F_2$ | Early Maturing Plants Selected | | Intermediate Maturing Plants Selected | | Total Number of Plants Selected | |
|---|---|---|---|---|---|---|---|
| | | No. of Plants | Percent | No. | Percent | No. | Percent |
| Ai ya dui lun | 3,300 | 36 | 1.09 | 20 | 0.61 | 56 | 1.70 |
| IR 28 | 5,720 | 35 | 0.61 | 50 | 0.87 | 85 | 1.48 |
| 760209 | 19,800 | 112 | 0.57 | 95 | 0.48 | 207 | 1.05 |
| Zai 9 | 7,920 | 34 | 0.43 | 45 | 0.57 | 79 | 1.00 |
| Guang lu ai No 4 x IR 24 | 22,192 | 52 | 0.23 | 45 | 0.20 | 97 | 0.43 |
| Shao Nuo | 14,349 | 57 | 0.40 | 1 | 0.01 | 58 | 0.41 |
| Hong wo shu mi | 5,720 | 16 | 0.28 | 0 | 0 | 16 | 0.28 |
| Da nan te | 5,636 | 6 | 0.11 | 0 | 0 | 6 | 0.11 |
| Shuang zhen 3 | 4,840 | 3 | 0.06 | 4 | 0.08 | 7 | 0.14 |
| Tie gu zhong | 10,226 | 2 | 0.02 | 0 | 0 | 2 | 0.02 |
| Suo dao 2 | 1,912 | 0 | 0 | 0 | 0 | 0 | 0 |
| Guang chang 13 | 1,540 | 5 | 0.32 | 0 | 0 | 5 | 0.32 |
| Jia qing zao | 6,864 | 0 | 0 | 2 | 0.03 | 2 | 0.03 |
| Sheng li xian | 1,440 | 0 | 0 | 0 | 0 | 0 | 0 |
| Zhen zhu zao | 2,400 | 0 | 0 | 0 | 0 | 0 | 0 |
| Zhe nong 3288 | 1,442 | 0 | 0 | 0 | 0 | 0 | 0 |

development and early tillering can assure that there are more effective panicles to supplement the weakness of shorter panicles and fewer grains of early maturing varieties.

(III) The tentative idea of cultivating paddy rice varieties that are "early maturing, that produce bumper harvests, that are resistant to adversity" step by step.

The early maturing characteristic and the various major characteristics of paddy rice that constitute yield are all quantitative characteristics controlled by multiple genes. It is rather difficult to combine together the quantitative characteristics of many kinds and many genes through one or two hybridizations and selection to breed varieties that "are early maturing, that produce bumper harvests, that are resistant to adversity." In the practice of breeding, we have frequently found that the earlier the variety matures, the poorer the yield and the poorer the resistance to disease. But, based on analysis, the three main characteristics of the number of panicles, the number of grains and the weight of grains that constitute the yield of paddy rice do not all conflict with the characteristic of early maturity. The characteristics of early maturity and abundance of panicles can be very easily combined together. We have statistically tabulated the correlation coefficients between the characteristic of early maturity and the number of effective panicles per plant of the $F_2$ generation of hybrid combination of eight early maturing parents and intermediate and late maturing parents. The results show that except for one combination that reached the dominant level of the theoretical value of 5 percent, the remaining seven combinations did not reach the dominant level (Table 4). For more than 10 years, the early maturing and extra early maturing varieties for the early crop which we cultivated are all panicle number type varieties. For example, survey of the fields of bumper harvests of "Qing xiao jin zao" and "San qi zao" and such extra early maturing varieties that produce a per mu yield of 800 jin shows the number of effective panicles per mu all approach 400,000, but each panicle has only about 40 grains. This shows that an abundance of panicles is the basis for producing better yields by the early maturing and extra early maturing varieties, and only early maturing and extra early maturing varieties can have so many effective panicles and still grow and develop normally and fruit normally.

Table 4. Correlative Coefficients of the Growth Period and the Effective Panicles of Each Plant

| Name of Combinations | r |
|---|---|
| Tang quan zao x IR28 | 0.080 |
| Hui ke shi x IR 28 | 0.064 |
| Tang quan zao x Tie gu zhong | 0.002 |
| 760209 x Guang lu ai No 4 | -0.012 |
| Guang lu zi No 4 x 760209 | -0.159* |
| Hui ke shi x 760209 | -0.129 |
| Qing xiao jin zao x Tie gu zhong | -0.027 |
| Er jiu qing x Guang chang 13 | 0.119 |

* df = 198 r 0.05 = 1.38 r0.01 = 0.181

The second is the relationship between early maturity and the weight of grains. In production, there are many early maturing and extra early maturing varieties that have a relatively heavy thousand grain weight. We have analyzed the correlation coefficients of early maturity and length of grain and width of grain of the $F_2$ generation plants of eight hybrid combinations. The results are different for different combinations. They are positively and negatively correlated as extremely dominant, dominant and not dominant. This shows that the characteristic of early maturity and the characteristic of large grains can be combined together through appropriate combination of parents and selection from the offspring generations to increase the yields of early maturing varieties.

Shortening of the growth period and at the same time having shorter panicles, fewer grains are phenomena that exist quite commonly. They are also one of the hindrances to improving the yields of early maturing varieties at present. But the Boluo County Agricultural Science Institute used the method of induced mutation and systematic selection to selectively breed from the mutant offspring of "Ke 6" some early maturing plant lines with large panicles whose entire growth period is not more than 100 days and whose main panicles have more than 100 grains. This shows early maturity and short panicles are not absolute.

How can the characteristics of early maturity and extra early maturity of early rice be combined with the characteristics of the number of panicles, the number of grains and the weight of grains to cultivate early maturing and high yielding varieties? Our tentative idea is to divide it into three steps. First we combine early maturity with the characteristic of an abundance of panicles. For over 10 years our institute has been engaged in this work. On this foundation, we are working on the second step. This is to use the existing early maturing varieties with an abundance of panicles as the parents to cross with various varieties to increase the thousand grain weight. After obtaining varieties with pure combinations of early maturity, abundance of large panicles and abundance of grains or intermediate materials, induced mutation and hybridization can be used to comprehensively combine the characteristics of large panicles and abundance of grains to further increase the yields of early maturing and extra early maturing varieties of the early crop.

Our institute began the work of selectively breeding early maturing and high yielding varieties for the late crop relatively late. The work of the previous stage was mainly involved in the breeding of the series of early maturing and extra early maturing varieties that can retain most of the superior characteristics of the original varieties and that are still tall stemmed varieties of intermediate materials such as "Guang er xuan san," "Han lu zao," "Guang er xuan si," "Guo qing zao" that were successfully bred from the main late maturing variety "Guang er xuan er" of our region's late crop by the method of line selection of early maturity. In recent years, we have used these varieties and materials as the parents and crossed them separately with different types of short stemmed varieties by the two-step method of first selecting the characteristic of early maturity and then dwarfing, with the aim of making the "Guang er xuan 2" mature 15 to 20 days earlier and dwarfing the plants by 15 to 20 centimeters.

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GUANGDONG

## UTILIZATION OF HETEROSIS OF 'THREE LINES' OF PADDY RICE

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[Article by Deng Yuanqing [6772 0337 1987] of the Bureau of Agriculture of Shaoguan Region: "Several Problems Concerning the Utilization of Heterosis of the 'Three Lines' of Paddy Rice"]

[Text] Our region began to test plant hybrid rice in 1975. Most of the areas of the entire region realized large scale increases in yield. Up to 1978, hybrid rice was propagated over 1.067 million mu, average per mu yield was 588 jin, and the unit yield was 160 jin more than harvests from regular rice. Late crops covered over 807,000 mu, average per mu yield was 568 jin, an increase of 205 jin per mu over regular rice. Historically, Shaoguan has been a low yield area of Guangdong, a per mu yield of 1,000 jin is rarely seen. After propagation of hybrid paddy rice over large areas, the statistics of 1978 for the entire region showed that over 162,000 mu produced a per mu yield per crop of 800 to 1,000 jin, and over 8,700 mu produced over 1,000 jin per mu per crop. These high yielding fields (plots), whether they were early, intermediate or late crops, whether in the southern, central or northern part, whether in the mountain regions or in the plains, whether they belonged to scientific research units or commune brigades, all produced such high yields. The Chengxi Brigade of Sanjiang Commune of Liannan in the northwestern mountain region is an example. The brigade has 2,030 mu of paddy fields. The early crop of hybrid rice of 1978 covered 631 mu, the per mu yield was 938 jin, the late crop covered 1,859 mu, the per mu yield was 810 jin. Of this, there was 10 mu of continuous expanse of double heterosis experimental fields that produced an annual per mu yield of 2,194.9 jin, surpassing 1 ton of food grains. In 1979, there was a continuous expanse of 100.2 mu of demonstration fields of early crop for heterosis. The average per mu yield was 1,013 jin. The Lianshan County Agricultural Science Institute planted an early crop in 1979, its highest yielding 1.35 mu produced a per mu yield of 1,346.2 jin. In addition, in recent years, many places have utilized the characteristics of early maturity and high yield of hybrid rice planted as the intermediate and late crop. This is beneficial to using and nurturing the land. With increasing the total yield as the goal, the winter planting and the tilling system of single season intermediate rice were appropriately adjusted and a new road was created. For example, some localities changed one cropping to double croppings, some localities changed triple croppings to double croppings with a winter green manure crop, some localities implemented triple croppings and triple high yields a year because of the early arrival of the winter planting season.

Production practices of several years have fully proven that planting of hybrid rice in our region is successful. It shows visible superiority over regular rice. It is an important way to increase the yield of paddy rice on a large scale in our region. But, in popularizing hybrid rice throughout the region, the development has not been balanced. Most localities greatly increased their yields, increases at a few localities were not visible, and individual localities even had reduced yields. Why is it that hybrid rice did not produce increased yields at some localities and even yielded less? Why are some localities still not considering planting more hybrid rice? We believe there are the following three main reasons: One is improper selection and use of hybrid combinations and the purity of the seeds is not high. The second is the planting area suddenly developed too rapidly and the cultivation techniques could not catch up. The third is that some regions do not have a consistent recognition of the superiority of hybrid rice, some places believe the cost of seed propagation is high, a lot of work is involved and the increases in yield is not worth it etc. It should be realized that these problems are not brought about by the nature of hybrid rice itself. These can all be solved by summarizing experience and lessons and doing farm work well.

We shall present some of our views concerning the following questions for discussion.

## The Utilization and Basis for Hybrid Rice in Our Region

Summarizing the experience of the various localities, we believe that based on the natural conditions of light, temperature and water in our region and the current popularization of the combinations of the three lines of Shanyou and Weiyou, hybrid rice can be utilized and it will produce high and stable yields regardless of whether it is planted as an early, intermediate or late crop or in the southern, central or northern parts and in mountain regions or in plains, and the potential for increased yields is very great. But the growth periods of the combinations of the three lines presently being propagated are too long, and they cannot adapt completely to the existing system of cultivation. Therefore, for the entire region, a positive attitude must be taken to suit measures to local circumstances and to utilize hybrid rice rational in distribution.

### 1. On the question of utilizing hybrid rice as the early crop

The hybrid combinations of the three lines currently being propagated have been planted over large areas for 3 years in some areas of our region. It has been proven that using them as the early crop can fully develop their superiority to seize high yields. The Lianshan County Agricultural Science Institute planted hybrid rice as an early crop over large areas for 3 years and the average per mu yield per crop surpassed 1,000 jin, the annual mu yield surpassed 1 ton of food grains and tripled the yield, stipulated by the guideline. In comparison, using hybrid rice as the early crop produces over 200 jin more per mu than using it as the late crop. Practice proves that utilization of hybrid rice as the early crop has a bright future. We believe the following three aspects are fundamental: One is the hybrid combinations currently being propagated are varieties sensitive to temperature. When used as the early crop, the growth period is longer and the period of utilization is longer than that when used as the late crop by 15 to 20 days. More nutrients are accumulated, and with a longer time for preparation for planting the early crop, fertilizers are more sufficient, and these are advantageous to developing the superiority of the characteristics of the varieties to seize high yields. The second is that hybrid rice has a stronger resistance to cold during its seedling period. This point is very advantageous to cultivating strong tillering seedlings in early spring and improving the percentage of grown seedlings. For example, the percentage of grown seedlings of the "Nanyou No 3" sown as the early crop on 17 March 1976 by the Liannan County Agricultural Science Institute reached 81 percent even though there were 25 days of low temperatures and overcast and rainy weather up to 12 April and temperatures below 12°C lasted continuously for 12 days and temperatures below 7°C lasted continuously for 4 days. The death rate among "Zhen zhui zi No 11" and "Ke 661" sown at the same time reached 25 to 35 percent. The third is timely sowing and transplanting of the early crop so that the middle and latter periods of growth of hybrid early rice can benefit from more suitable conditions of light and temperatures. This is extremely advantageous to developing the characteristics of large panicles and abundance of grains and increasing the fruiting percentage and the economic superiority of increasing the thousand grain weight, thus seizing high yields. But, because of the long growth period when utilized as the early crop, to produce increases in yield for each crop and to realize high yields throughout the year, hybrid rice can only be arranged as late maturing or extra late maturing varieties. At the same time, it must be sown appropriately early, and effective measures must be taken in cultivating the seedlings to be in time for the season. In the southern region, consideration can be given to utilizing hybrid rice as the major late maturing variety sown appropriately early, and using thin nylon sheets to cultivate the seedlings or the method of cultivating seedlings in two stages by cultivating the seedlings under thin nylon sheets and then planting them temporarily as popularized by the Guangyingde Dazhan Commune so that maturation occurs earlier. In the central and northern parts, hybrid rice can be utilized as an extra late maturing variety in combination with others. Similarly, it must be sown appropriately early, and the method of cultivating seedlings in two stages using the greenhouse and the addition of nylon covering popularized by the Lianshan County so that the maturation period can catch up to or approach the maturation period of "Zhen zhu ai" must be used so that the season for the late crop will not be affected. The proportion of hybrid rice used in the early crop should be determined by the strength of manual labor and animal labor forces and the degree of mechanization of the various localities.

2. The question concerning the use of hybrid rice as the middle crop

Because of the characteristic of a long growth period of the hybrid combinations currently being popularized, they are middle crop type varieties. When used as the middle crop in the mountain regions of the central and northern parts, the early, middle and late period of growth all have good light and temperature conditions, the crop is not affected by low temperatures, nor threatened by high temperatures. The conditions for cultivating the seedlings during the early period are good and strong tillering seedlings can be easily cultivated. During the middle and late periods of growth, the light and temperature conditions are good and beneficial to growth and development, the fruiting percentage and the thousand grain weight can be increased, and the conditions are advantageous to developing the superiority of the characteristics of the varieties to seize high yields. This is fully illustrated by the Yunyan Commune or Lechang County which produced a per mu yield of over 1,000 jin of hybrid rice in one cropping over a large area. There are another over 200,000 mu of single season middle crop fields throughout the region which can be divided into two types: One type is the single crop waterlogged fields in the south. Because the low marshland is soaked in water, whether it can be utilized is determined by the conditions of water in the year. The other type is the single season middle crop fields of the mountain regions of the central and northern parts. There is over 100,000 mu. This type can be fully used to plant one crop of hybrid intermediate rice, one crop of beans or potatoes in a big way to realize large scale increases in yield.

3. On the question of utilizing hybrid rice as the late crop

For over 20 years since liberation, the yields of the late crop in our region have remained low and unstable for long periods. After propagation of hybrid rice over large areas during the past 2 years, the yield of the late crop has changed greatly. The county commune brigades that have propagated it over large areas have realized stable and high yields and large scale increases in yield. This has served greatly in changing the unstable situation of our region and turning the situation of long periods of low and unstable yields of the late crop around. Why has the planting of hybrid rice as the late crop produced such a big increase in yield? We believe there are three main underlying objective reasons:

(1) Utilization of hybrid rice as the late crop can effectively avoid the cold dew winds to realize early maturation and stable and high yields. Our region is situated in the mountain areas of northern Guangdong. According to the three large types of regions of natural disasters throughout the province (the northern cold disaster regions, the central typhoon and cold disaster region, the southern typhoon disaster region), our region belongs to the northern cold disaster region. Therefore, the late crop frequently is damaged by cold dew winds, causing low and unstable yields of the late crop over the past years. Utilization of hybrid rice as the late crop and sown and transplanted at the appropriate time enable the plants to mature early, and the plants can more safely avoid the cold dew winds, thus removing the passive situation of the typical late crop which could only head after passing

through the short sunshine period following "the autumn equinox" and avoid frequently encountering cold dew winds. Because the hybrid combinations of Shanyou and Weiyou currently being propagated possess medium sensitivity to light and temperatures, the seedling age for replanting in autumn is more flexible, and at the same time, Shanyou and Weiyou both have a better resistance than ordinary rice that are being replanted in autumn at present, therefore, they produce more stable and higher yields.

(2) Effectively utilizing the light and temperature resources in our region has created conditions for the late crop to produce a higher yield than the early crop. The period from July to September has the best light and temperature conditions in our region. Hybrid rice possesses the characteristic of highly efficient photosynthesis. If the hybrid rice is sown during the middle and last 10 days in June, and harvested during the middle and last 10 days of October, for most of the time the plants can grow under sufficient sunlight, a rich source of thermal energy, suitable temperatures and such weather conditions. During the 122 days from the time of sowing on 25 June to the time of maturation on 25 October, the total amount of solar radiation is 50,090 calories. This is superior over the light sensitive varieties planted as the late crop. Also, the temperatures are appropriate, the average temperature during the heading and flowering period is from 24°C to 26°C, and it is between 22°C and 24°C during the filling period. These temperatures are within the scope of physiologically suitable temperatures. In addition, the differences between daytime and nighttime temperatures are great (a difference of 8°C to 9°C). These are beneficial to full filling of the seed grains.

(3) The currently available hybrid rice is temperature sensitive varieties. When planted as the late crop, they can effectively utilize the high temperatures and strong sunshine during the early and middle periods of growth, and mature earlier than ordinary rice by 20 to 30 days. Besides avoiding the cold dew winds, and assuring the stable and high yields of the late crop, they also make it possible for an early winter planting season to realize triple cropping a year and increased yields of every crop.

But it must be pointed out that utilizing hybrid rice as the late crop also has its shortcomings. First, the growth period is shortened. The superiority of the individual plant is poorer than that of the early crop, the panicles are shorter, the number of grains is fewer. Second, there is less fertilizers for the late crop. Third, the base number of insect sources during the late crop is greater. Therefore, in utilizing hybrid rice as the late crop we must pay attention to cultivating strong and healthy seedlings, increasing the application of fertilizers, and strengthening the prevention and control of disease and insects.

4. On the question concerning the utilization of double heterosis

This has been successfully experimented with and demonstrated at some county commune brigades. Practice has proven that it is an important way to greatly and rapidly increase the yield of paddy rice. In the future, the entire region should actively create conditions to develop the early crop of hybrid rice and implement two continuous croppings of a definite ratio in the development of hybrid paddy rice. "Fields producing a ton of food grains" (or fields producing double the yield stipulated in the guideline, double heterosis, two-stage cultivation (i.e., cultivating seedlings in two stages via the early and late crops, adjusting the conflicts between seasons) should also be planted. All regions that have good conditions, especially southern regions where the temperature and light conditions are better and the conflict between the seasons is not great and where there are many people and less land, where manual labor and animal labor forces and fertilizers are sufficient, and where the degree of mechanization is higher, can all actively create conditions for engaging in planting hybrid rice in a big way.

In general, according to the situation of the entire region, and summarizing the practical experience of the past several years, the general principle concerning the question of the utilization and distribution of hybrid paddy rice is: Actively engage in planting hybrid rice by creating conditions for planting hybrid rice as the early crop, greatly engage in planting hybrid rice as the middle and late crops, and engage more in double heterosis at places where the conditions are better. In the planting ratio for the early crop, the ratio should be larger in the south and smaller in the central and northern parts. For the late crop, the ratio should be smaller in the south and larger in the central and northern parts. In the high and cold mountain regions over 600 meters above sea-level, where the yield of double season rice is not high, single season high yielding intermediate rice can be planted. Where the conditions are good, another crop of black beans or potatoes can be added, or another crop of seedlings can be left in the fields for regeneration, or another crop of safflower seeds can be left in the field for regeneration. The multiple planting index can be increased to increase the total yield of the year.

## Question Concerning the Major Cultivation Techniques of Hybrid Rice

### 1. Question concerning the selective use of combination

After several years of practice, everyone unanimously agreed that the Shanyou and Weiyou lines are better. Their common characteristics are: the plant type is clustered, the comprehensive characteristics are good, the fruiting percentage is high, their resistance to blast of rice is strong, they produce stable and high yields. The No 2 and No 3 lines have large panicles and plenty of grains, the heterosis is strong, the No 6 line has a good resistance, and matures earlier. The differences between the two are: Shanyou line has more effective panicles than the Weiyou line. The thousand grain weight of "Weiyou No 3" is heavier than that of the Shanyou line by 2 grams. "Weiyou No 6" used as the material for regional test planting in four croppings over 2 years in our region performed very well. Each county generally believes "Weiyou No 6" can be propagated over large areas.

At present, the types of combinations of hybrid paddy rice are few. Combinations have not been formed for the early, middle and late crops, and in application in production, there are still some limitations. Therefore, when each locality propagates and utilizes hybrid paddy rice, a rational combination with the ordinary varieties should be taken into consideration so that measures can be suited to local circumstances and the distribution will be rational.

## 2. On the question of the seasons for sowing and transplanting

The number of days of growth for paddy rice throughout the year in our region is relatively short, generally between 250 and 226 days (only about 210 days in the high and cold mountain regions). During this growth period, there are two "cold disasters" that greatly threaten the production of paddy rice. One is during the early period of the early crop when seeds are sown. The crop is frequently threatened by low temperatures and cold and damp weather, causing the seedlings to rot, loss of superior seeds, and delaying the season. The other is during the latter period of the late crop when cold dew winds attack, affecting the yield. This is an important reason that has caused low and unstable yields of the late crop in past years. The focal point of the season for sowing and transplanting throughout the year in our region is whether the late rice can safely head uniformly to avoid the cold dew winds. The period of uniform heading of late rice is mainly determined by the sowing period. But it is also closely related to the transplanting period, the quality of seedlings, the quality of transplanting and field management. In particular, the earliness or lateness of transplanting greatly affects the uniform heading period. Therefore, under the prerequisite of grasping the appropriate time for sowing, the appropriate time for transplanting must also be grasped. Determination of the appropriate time for sowing must be based on the meteorological data in ordinary years of that locality, the number of days from sowing to uniform heading of that combination, and the sowing time is determined by counting backwards from the time of safe and uniform heading. Safe and uniform heading and filling and fruiting of hybrid rice have a higher demand upon temperature than ordinary xian rice varieties. According to studies and observation by concerned units, the meteorological indicator of safe and uniform heading of hybrid rice is that the daily average temperature is not lower than 24°C. For the fruiting percentage to reach above 80 percent, the average daily temperature during the 5 days after uniform heading must not be lower than 23°C. According to this temperature indicator, and combining the safe and uniform heading time in ordinary years at each locality, and in reference to the experimental data on temperature and light, the appropriate sowing period of "Shanyou No 6" is generally as follows: Sowing should be completed before 10 July in the southern plains and hilly regions. Sowing should be completed before 1 July in the central and northern plains and hilly regions. Sowing should be completed before 25 June in the central and northern mountain regions. Sowing should be completed before 15 June in the high and cold mountain regions. Under the prerequisite of timely sowing, transplanting at an appropriate time must also be grasped. It is best to complete transplanting before 5 August in the southern plains and hilly regions, and not later than 8 August. It is best to complete transplanting before 1 August in the central and northern plains and hilly regions, and not later than 5 August. In the northern mountain regions, transplanting should be completed before 25 July. In the high and cold mountain regions, transplanting should be completed before 20 July. Such arrangement of the seasons in ordinary years will generally enable the plants to avoid the cold dew winds and achieve safe and uniform heading.

### 3. On the question of cultivating healthy seedlings

The number of seedlings of hybrid rice transplanted is fewer, and high yields mainly depend upon tillering and formation of panicles. Therefore, the goal of cultivating seedlings should be to cultivate short and strong seedlings of appropriate age with tillers. The standard of healthy tillering seedlings can be described in four sentences in general: The stems are thick, short and strong, the roots are short, plentiful and white, the seedling plants are green and without disease and not afflicted by insect pests, each plant has 2 to 3 tillers. The following links resulting from a combination of the experience of each locality should be grasped to cultivate tillering healthy seedlings.

(1) Sparse and even sowing is the key to cultivating tillering healthy seedlings and increasing the quality of the seedlings. For the past 3 years, Xinyu Commune in Yangshan County paid attention to applying sufficient fertilizers, did the work of building the seedbeds well, and grasped the link of sparse and even sowing in particular to cultivate tillering healthy seedlings. The commune first allowed the agricultural science station to conduct a comparative experiment in sparse sowing and discovered that the quality of the seedlings in fields sown with 20 jin of seeds per mu was better than that sown with 40 jin of seeds per mu and the percentage of tillering increased by 17 percent. The number of plants with 2 tillers increased by 42 percent and the number of plants with 3 tillers increased by 48 percent. The fresh weight of 100 seedling plants increased 32.1 grams (i.e., an increase of 27.3 percent). The yield of each mu increased 57.2 jin (i.e., an increase of 7.3 percent in yield). For several years they insisted on sowing 20 to 25 jin of seeds per mu for the early crop, the seedling age was about 40 days with 5 to 6 leaves. Between 15 and 20 jin of seeds were sown for the late crop, the seedling age was about 30 days with 6 to 7 leaves. To make the sowing even, they tried sowing one seed at a time and weighing seeds for each small plot. Fewer seeds were sown at one time and seeds were sown several times so that the seeds were sown evenly. By sparse and even sowing, each seedling plant received sufficient sunshine and nutrients, and in this way, conditions have been created for cultivating tillering healthy seedlings.

(2) Using thin nylon sheets to cultivate seedlings and cultivating seedlings in two stages is a good method of seizing early sowing, preventing rotting seedlings, increasing the quality of the seedlings, and increasing the percentage of grown seedlings. There are more difficulties in our region to cultivate tillering healthy seedlings of hybrid rice for the early crop. The main difficulty is the threat of low temperatures and overcast and rainy weather. Rotting of the seedlings is severe and the percentage of grown seedlings is slow. During the recent 2 years, each locality used thin nylon sheets to cultivate seedlings in large fields and experimented with the two-stage cultivation of seedlings in the greenhouse and by covering with nylon sheets, and cultivating seedlings by covering with thin nylon sheets and then temporarily transplanting the seedlings in the open fields. Practice proves all these methods can increase the temperature and prevent cold, thus cultivating healthy seedlings and enabling the plants to mature earlier. For example, the agricultural science

institute of the Lianshan County used the "Weiyou No 3" variety in the early crop of 1978 to experiment with the three methods of cultivating the seedlings in two stages in the greenhouse and then covering them with nylon sheets, cultivating the seedlings by covering them with nylon sheets in the large fields and cultivating the seedlings in the open fields. Within 25 days after sowing, the effective cumulative temperature of the seedlings cultivated in two stages in the greenhouse and by covering them with thin nylon sheets was 199.5°C, an increase of 78.8°C over the seedlings cultivated in large fields covered with nylon sheets, and maturation was 4 days earlier. The cumulative temperature was also 140.7°C more than the effective cumulative temperature of seedlings cultivated in the open fields and maturation was 9 days earlier. The effective cumulative temperature of seedlings cultivated in large fields covered by nylon sheets was 120.7°C, an increase of 61.9°C over that of the seedlings cultivated in the open fields and maturation was 5 days earlier. The results of the experiments to compare quality of the seedlings cultivated under nylon sheets and in the open fields conducted by the agricultural science station of the Xinyu Commune of Yangshan showed the percentage of grown seedlings cultivated under nylon sheets reached 93.8 percent, the percentage of tillering seedlings was [illegible] percent, higher than the 17.7 percent and 28 percent of seedlings cultivated in the open fields respectively.

As hybrid early rice was being propagated, some commune brigades of Fucheng in Lianxian and Sanjiang in Liannan tried two-stage cultivation of seedlings. The method was as follows: In the first stage, the seedling age was 15 days, the seedlings were cultivated in wet conditions, the amount of seeds sown in each mu of the seedbed was about 100 jin; in the second stage, the seedling age of seedlings temporarily planted away from the seedbeds was about 25 days, the planting density of the temporarily planted single plants was 2 x 2.5 cun or 2 x 3 cun. During the first stage, a special seedbed was alloted. During the second stage, the fields left after harvesting early maturing early rice were used as the temporary fields for the seedlings. The temporary fields for the seedlings were set up near the large fields to save labor required to relocate the seedlings. The ratio of the special seedbeds, the temporary fields for the seedlings and the large fields is generally as follows: Seedlings in one mu of special seedbed can be planted in 4 to 5 mu of temporary fields for seedlings and this in turn can be planted over 16 to 20 mu in the large fields. They believe there are many advantages of doing this. One is that it can reduce the special seedbeds that have to be kept beforehand, the area of the early crop can be expanded, and the total yield can be increased. The second is that the seedlings are short, strong and have tillers, and by transplanting them early, they can produce high yields, thus solving the seasonal conflict between the delay in the maturation time of the early crop and inability to transplant the late crop in time. The third is that the roots of the seedlings are short, and the seedlings can be easily uprooted, there is less weeds, and costs and farm chemicals can be conserved.

(3) Application of sufficient fertilizers and constructing the seedbeds according to high standards are the bases for cultivating strong seedlings. The comprehensive experience of the localities indicates that fields with a medium fertility and a clean water source and which can be easily drained and

irrigated should be used as seedbeds. The fields should be plowed every other year and dried in winter. Sufficient base manure should be applied, the fields should be carefully and finely plowed and harrowed, weeds should be removed, sclerotinia should be cleared away, the trenches and the ridges should be clearly separated and the surface of the ridges should be level.

4. On the question concerning the structure of the colony

Hybrid rice depends on tillering and the formation of panicles to produce high yields. Its individual superiority is mainly manifested by large panicles, abundance of grains and the weight of grains. Viewing the situation of several years of cultivation in our region, during the first 2 years, in general, the planting was overly sparse, the number of seedlings transplanted was insufficient, and at the end the number of effective panicles was too low, and now, some localities seem to have planted too densely. These two methods are both irrational. Overly sparse planting will result in a lesser number of effective panicles which is unfavorable to seizing high yields. Overly dense planting will prevent the hybrid rice from developing its superiority, and at the same time, using too many seeds will increase the cost. Therefore, in cultivation, rational dense planting must be done. The superiority of the individual plant must be fully developed and the structure of the colony must also be good before high yields and bumper harvests can be realized. Practice shows that the number of panicles required of hybrid rice is lower than that required of ordinary rice, but the number of grains per panicle must be much greater. Therefore, in cultivation, attention must be paid to utilizing the characteristics of the hybrid varieties to form tillers and panicles and large panicles. Rationally dense planting must be implemented before the superiority of the variety can be fully developed to seize high yields.

We surveyed 28 plots yielding between 1,000 and 1,200 jin per mu in 9 counties during the early crop in 1978. Analysis of the structure of the colony is generally as follows: The number of seedlings transplanted per mu is between 37,000 and 110,000 (averaging 75,000), each mu has 147,000 to 225,000 (averaging 181,600) effective panicles, the total number of grains per panicle is 112.3 to 162.5 grains (averaging 145.4 grains), the number of full grains per panicle is 89.6 to 150 grains (119.3 grains), the fruiting percentage is between 62.5 and 92.9 percent (averaging 82 percent). We surveyed 12 fields of a per mu of 800 and 1,000 jin, the average number of effective panicles per mu was 166,500, in contrast, the former has 15,100 more panicles than the latter. Based on the data of this survey and combining the practice of large area production over the past several years, we can conclude that the rational density of planting hybrid rice in general should be appropriately sparse in the early crop and appropriately dense for the late crop, appropriately sparse in fertile fields and appropriately sparse in the early crop and appropriately dense for the late crop, appropriately sparse in fertile fields and appropriately dense in infertile fields, appropriately dense in fields transplanted late. Concretely: The distance between plants should be 4 to 5 cun, the distance between rows should be 6,7,8 cun. In fields that produce 700 to 800 jin per mu per crop, the base number of seedlings transplanted per mu (including tillers, same as follows) should be 50,000 to 70,000, the number of effective panicles per mu should be 130,000 to 150,000, the number of full grains per panicle should be 100 to 110 grains, the thousand grain weight should be about 27 grams. In fields producing 1,000 jin per mu per crop, the base number of seedlings transplanted per mu should be 70,000 to 90,000, the number of effective panicles per mu should be 180,000 to 200,000, the number of full grains per panicle should be 110 to 130 grains, the thousand grain weight should be about 27 grams. In the method of transplanting, the "double ridged rows" should be used with a wide distance between rows and a narrow distance between plants.

## 5. On the question concerning management of fertilizers and water

### (1) Level of Application of Fertilizers

The root system of hybrid rice is developed, its absorption ability is strong. In large area production, hybrid rice manifests the ability to produce high yields with an abundance of fertilizers and increased yields with less fertilizers. According to the experience of the high yielding fields of hybrid rice planted at each locality over the past 2 years, applying 20 to 45 jin of pure nitrogen per mu can produce a yield of over 1,000 jin per mu. But in rice fields of medium and higher fertility, usually 20 to 30 jin of nitrogen applied per mu are sufficient. For example, the base point group of the Yangshan County Agricultural Bureau stationed at Xinyu Commune experimented with the application of 5 different amounts of nitrogen, 20, 25, 30, 35 and 40 jin during the early crop of 1977. Of the amount of fertilizers applied, 60 percent served as base manure, 40 percent served as sidedressing and all were applied 10 days after transplanting. The results showed that the yield of the fields applied with 20 to 30 jin of nitrogen was the highest, the per mu yield of the field applied with 20 jin of nitrogen was 1,059 jin, the per mu yield of the field applied with 25 jin of nitrogen was 1,005 jin, the per mu yield of the field applied with 30 jin of nitrogen was 1,073 jin, while the per mu yields of the fields applied with 35 and 40 jin of nitrogen were both below 950 jin. Also, according to preliminary measurements obtained in Hunan, ordinary rice that produces a per mu yield of 1,000 jin absorbs 24 jin of nitrogen, 11 jin of phosphorus, 27 jin of potassium, while hybrid rice absorbs about 20 jin of nitrogen, 9 jin of phosphorus, and 35 jin of potassium. This experiment shows that the amount of nitrogen and phosphorus absorbed by hybrid rice to produce a unit amount of rice grains is less than ordinary varieties, but the amount of potassium absorbed is visibly higher. The agricultural science institute of Qingyuan County planted "Shan you No 2" as the early crop in 1978, and conducted a comparative experiment of applying and not applying potassium chloride. The results showed that the per mu yield of fields not applied with potassium chloride was 733 jin, the per mu yield of the field applied with 10 jin of potassium chloride per mu was 808 jin (an increase of 75 jin over the control), the per mu yield of fields applied with 20 jin of potassium chloride per mu was 833 jin (an increase of 100 jin over the control), and the per mu yield of fields applied with 30 jin of potassium chloride per mu was 860 jin (an increase of 127 jin over the control). This showed that hybrid paddy rice is especially sensitive to potassium fertilizers. Appropriate increase in the application of phosphorus and potassium fertilizers is an important measure to develop the potential of hybrid rice to produce increased yields. It is worth noticing that many localities have proven through practice that because the root system of hybrid rice is developed, because of its strong ability to absorb fertilizers, during the first year or two of planting when the amount of fertilizers is deficient, although a definite yield can be produced, often the potential nutrients of the soil are utilized. Therefore, as the yield is increased, attention must be paid to deep tilling and improving the soil, the application of fertilizers should be increased, especially organic fertilizers and potassium fertilizers should be increased to nurture the fertility of the land before high and stable yields can be maintained.

### (2) Method of Application of Fertilizers

At present, in high yielding fields of hybrid rice, the method of "attacking the early period, strengthening the ending period, and supplementing the middle period" in the application of fertilizers is used. This coincides with the physiological characteristics and the demands of cultivation of hybrid rice. The characteristics of cultivating hybrid rice is the dependence upon a massive number of tillers to form large panicles and produce many grains to seize high yields. The physiological characteristic is that during the early period of growth, photosynthesis is stronger, the intensity of respiration and photosynthetic respiration is low, there is a lot of accumulation, consumption of nutrients is less, the roots grow rapidly, tillering is early, and a larger leaf surface area can be formed relatively quickly. Therefore, the fields should be prepared and steeped early and organic compost fertilizers or organic fertilizers that easily become compost should be used as base manure, surface layer fertilizers should be applied accordingly, fertilizers for the growth of tillers should be heavily applied early so that growth can be prosperous after transplanting and the basic manure and surface fertilizers constitute about 60 percent of the total amount of fertilizers applied. The amount of fertilizers applied as sidedressing during the early period of growth constitutes about 25 percent, the remaining 15 percent is used as fertilizers to strengthen growth during the latter period. During the middle period of growth, generally phosphorous and potassium fertilizers are applied in combination with drainage and exposing the fields to become dry. Under the present situation, chemical potassium fertilizers are less available, such phosphorous and potassium fertilizers as black and white ash and charred sod should be advocated and used more. Management during the latter period of growth of hybrid rice should be strengthened, and pellet fertilizers for the growth of panicles should be strategically applied. All of these measures will produce visible results in increasing the yield. According to observations of the flowering activities of the "Nanyou No 2" by the agricultural science institute of Lianshan County, it was discovered that there were 19.6 percent of empty and semi-filled grains. Of this, 5.8 percent did not flower, 7.3 percent flowered but did not complete fertilization (the ovaries did not expand). There were another 6.5 percent that were fertilized but during the latter period they stopped to develop and became semi-filled grains. The first two situations form empty grains, the last situation forms semi-filled grains, and they are closely related to the deficiency of the supply of nutrients after heading. Thus, for several years, the workers have paid a lot of attention to strategically applying pellet fertilizers for the growth of panicles during both the early and late crops, and good results of increased yields have been obtained. For example, the institute conducted an experiment during the early crop of 1978 to compare results of applying pellet fertilizers for the growth of panicles. Pellet fertilizers for the growth of panicles were applied at the time when the boot leaf has half emerged (the sixth stage of young panicle differentiation), 3 to 5 days before heading (the end of the seventh stage of young panicle differentiation) and after uniform heading. Two jin of urea was applied each time to each mu (concentration of 2 percent), and 12 grams of boric acid and 1.5 grams of zheng chan ling were added. The fertilizer was sprayed over the leaves. The results showed that the fruiting percentage was higher than that of the control region by 2.04 percent, the number of full grains per panicle increased by 11.2 grains, the thousand grain weight increased by 0.7 grams. According to the survey, application of pellet fertilizers for the growth of panicles over large areas and in small area experiments can increase the yield by about 10 percent.

### (3) Scientific Drainage and Irrigation

Summarizing the experiences of the localities, everyone unanimously agrees that the method of drainage and irrigation for hybrid rice is to irrigate in a shallow manner during the early period of growth for the plants to return green, wet the fields for tillering, during the middle period of growth, the fields should be irrigated sufficiently for the seedlings to expose themselves (drying the field), ordinary fields should be exposed early and lightly dried, special fields (such as lake side and coastal fields, rusty paddy fields, cold water fields, fields with a high underwater level, and highly fertile fields in which graminaceous seedlings grow too prosperously) should be exposed early and dried thoroughly until the ground breaks open. During the latter period of growth, the fields should be dried and wetted until the yellow ripe period, and emphasis should be placed on using flowing water and frequent irrigation and grasping in-between times for drainage and irrigation. This means to irrigate the fields once and allow the fields to dry naturally and then irrigate the fields once again so that the water from the first irrigation will not meet the water brought in later. The soil should be kept damp constantly to prevent the soil from drying up too early.

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# SOYBEAN ROTATION SYSTEMS LEAD TO INCREASED PRODUCTION

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[Article by Lin Dizhang [0491 6611 4545]: "Discussing the Path of Our Province's Soybean Production in View of the Progress of International Production of Soybeans"]

[Excerpt] Based on the good forms of the planting system that originally existed in our province and the relatively successful experience created by reforming the planting system in recent years, the systems of cultivation and planting and the methods of interplanting soybeans are mainly the following:

## (I) Spring Soybean

This refers to soybeans sown between 21 January and 5 April and harvested between 20 April and 21 June. This soybean crop covers the largest proportion of the area of soybeans sown in our province. It is also the most common soybean crop and a relatively high yielding crop. The rotation systems of spring soybean are as follows:

### (1) Spring Soybean--Late Seedbed

This system is mostly used near Guangzhou and regions to the north. Spring soybean can be sown earlier than the early crop, and generally can be harvested one season earlier than the early maturing variety of the early crop. Selection of land does not have to be very strict, therefore most of it is planted in relatively arid and infertile land. After harvesting the soybeans, the land is suitable for serving as seedbeds for the late crop.

### (2) Spring Soybean--Summer Sweet Potatoes

In the Shantou area, a small portion [of the crop area] is paddy fields, but generally dryland slopes are used. The crops are called "soybean garden sweet potatoes." Not only is the land more fertile because of the remnants of soybeans but soybeans can be harvested before the last 10 days of June, in time for early planting of sweet potatoes. Ordinarily, when autumn drought arrives, the crop can be harvested and a definite yield can be produced.

### (3) Spring Soybean--Late and Early Crop (early and intermediate crop)--Late Crop (also called soybeans, rice-rice)

This system is only used in Guangzhou and regions to the south. It is a planting system that has been gradually expanded in recent years. In the past, the regions of the middle and lower reaches of the Jianjiang in our province once practiced the system of planting "21 January" soybeans (called "Dong huang dou" locally) and transplanting the early crop after harvesting them on "20 April." During recent years, this system has been expanded to the central and eastern parts of our province. As long as labor is abundant and the seasons are grasped tightly, the system will generally be successful.

### (4) Interplanting Spring Soybeans

This system mainly involves interplanting soybeans in fields of dryland spring sown crops such as cassava, peanuts, sugar cane, sweet potatoes, in base fields (the masses call this "base field soybeans") and on forest land and gardens of young fruit trees. There are many forms, the potential is great, and this should be greatly promoted and actively popularized. In ordinary years, our province plants 3 to 4 million mu of cassava, and the areas of new plantings of fruit trees (such as the Chaozhou mandarin orange and the Xinhui orange), rubber and forestation are not small. Areas that are relatively expansive, not too steep, and where loss of water and soil due to leaching will not occur, can all be utilized by suiting measures to local circumstances for popularizing interplanting.

## (II) Summer Soybean

This refers to soybeans sown around 21 June to 7 July and harvested between 23 August and 8 September. It is also a planting system that has been developed gradually in recent years. The main planting systems are the following:

### (1) Early Rice--Summer Soybean--Late Rice

This was limited in the past to Gaozhou County and its neighboring area. That locality called summer soybean "Dan yao dou." It utilizes the period of rest between two crops (21 June to 23 August) by sowing soybeans in hard slab fields, seizing the season for planting, using highly dense planting (4 chi including the trenches, planting 5 rows, distance between plant and row is 6 x 5 cun, each mu is sown 12 jin to 15 jin of seeds). Base manure is applied in full (applying 200 to 500 jin of superior quality fertilizers such as the droppings of chickens, ducks and geese per mu, 80 to 100 jin of phosphorous fertilizers, 2 basket dan of wood ash). Under the prerequisite that the yields of the two crops of paddy rice before and following the summer soybean crop are assured of being equivalent to the yields of double season rice, each mu can produce an increased yield of about 150 jin of soybeans. But because the growth period of summer soybean is very short, this will only be successful where there are more people and less land, and where the standard of planting and cultivation is relatively high.

### (2) Early Rice--Summer Soybean--Late Autumn Sweet Potatoes

The last two crops are dryland crops. The seasonal requirements are not strict. Xinyi County has used this planting system in the past to plant about 20,000 mu. The usual per mu yield of soybeans is 150 to 200 jin. The per mu yield of late autumn sweet potatoes is about 3,000 jin. In recent years, the system has been changed to a planting system of "soybeans with sweet potatoes planted on the side," i.e., simultaneously planting soybeans and sweet potatoes. Sixty percent of the land is used to plant soybeans and 40 percent of the land is used to plant sweet potatoes. After harvesting the soybeans, the fields are banked to form sweet potato ridges. Although the yield of soybeans is thus slightly reduced, but because sweet potatoes have been planted over 2 months earlier, the per mu yield is generally 4,000 jin and the yield of the entire year visibly increases. In 1978, we test planted nearly 1 mu at Nianshan Brigade of Nianshan Commune. The yield was equivalent to 100 jin of soybeans per mu and 5,000 jin of sweet potatoes per mu.

## (III) Autumn Soybean

This refers to soybeans sown between 23 July and 7 August, and harvested around 23 October. The main systems are: (1) sowing soybeans in fields of spring sown crops such as sweet potatoes, corn, sorghum, millet, sesame and such dryland crops and leftover fields of seedbeds of the late crop in the south central region; (2) interplanting soybeans in autumn sweet potato fields and peanut fields. These two planting systems both have the potential for development, but the potential for development of interplanting soybeans in autumn sweet potato fields is even greater. Our province plants 5 million to 6 million mu of autumn sweet potatoes each year. If interplanting of soybeans is popularized, the total yield of this one item will be significant. An on-site meeting of the Shantou region was held in 1978 at the Luxi Brigade of Lugang Commune in Chaoyang County to popularize this interplanting experience. The brigade began test planting in 1971 and popularized it on an extensive scale in 1974. In 1978, all of the 724 mu of potato fields were interplanted with soybeans. One row was interplanted on each ridge using "Hui mian huang" and "Da li huang" varieties. The average per mu harvest of soybeans was 128 jin (the 18th Production Brigade averaged 152 jin throughout the brigade), and the per mu yield of sweet potatoes still reached about 5,000 jin. Qiling Commune in Puning County interplanted soybeans and sweet potatoes on 3,215 mu in 1978 (constituting 40 percent of the area of autumn sweet potato fields of the entire commune). The average per mu yield of soybeans was 208 jin. The entire commune harvested a total of 651,500 jin of soybeans from just this item alone.

It can be seen that as long as we emphasize [rational] thinking and conscientiously summarize experience and implement scientific rotation planting and interplanting and fully dig for the soil's potential, soybean production in Guangdong can be developed to a greater extent.

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# GUANGDONG

## BRIEFS

**CHAOYANG COUNTY RICE OUTPUT**--This year Chaoyang County promoted "Guichao" superior variety in large area cultivation for both its early and late crops, both of which produced bumper harvests, with yields averaging 1,655 jin per mu for the two seasons. Total output was 705 million jin, a 2.8 percent and 2.9 percent increase respectively over the previous year. Both per unit yields and total output exceeded the highest levels ever recorded. This year Chaoyang County has continued vigorous promotion of "Guichao" superior variety, planting "Guichao" as the early crop throughout the county on an area of 330,000 mu, or 78 percent of the total area planted to early rice. Yields for the early rice averaged 835 jin per mu for the whole province. Late crop "Guichao" accounted for 57.6 percent of the total late rice crop area, and late crop yields for the whole province averaged 820 jin per mu to maintain and continue the leading position of the entire region and the entire county. In order to insure a large area bumper harvest for "Guichao," Chaoyang County cadres and masses gave attention to reform of traditional planting techniques and even the farming system in view of the characteristics of "Guichao" and the local physical environment. Formerly one-sided emphasis was given to "earliness," with the sowing of "severe cold seedlings," in contravention of natural laws, which brought the punishment of nature. This year they used a seeking of truth in facts in arranging the production season, delaying the early crop season by an appropriate amount of time, and advancing the late crop season by a suitable amount of time so that the seasons for the early and late crops were as close as possible, thus avoiding the weather that causes rot in seedlings, and damage from "dragon boat water" and the "cold dew wind," and making full use of the light and heat resources of June and July. In farming techniques and plant protection, they noted the proneness to disease of "Guichao," reducing damage from disease to quite a low level through emphasis on prevention of disease and through prevention and control in cultivation. [Text] [Guangzhou NANFANG RIBAO in Chinese 31 Dec 80 p 2] 9432

**RICE PLANTING FORUM**--Personnel concerned of the southern paddy rice producing areas recently held a forum in Huaxian County in Guangdong Province on popularizing rice planting experiments. Guangdong Province has planted a total of 16 million mu of "Guichao" hybrid rice and the average production per mu was 60 to 80 jin higher than that for other crops. The forum held: It is necessary to popularize planting "Guichao" hybrid rice in order to reap a bumper harvest of grain. The forum also analyzed the disadvantages of "Guichao" hybrid rice, concluding that the power of resistance of "Guichao" hybrid rice is weak. Therefore, it is necessary to plant this kind of rice in accordance with local conditions, avoiding the shortcomings and playing up the advantages. [Guangzhou Guandong Provincial Service in Mandarin 1120 GMT 22 Jan 81 HK]

INCOME INCREASE--Guangzhou, 17 Feb (Xinhua)--Thanks to the overall development of agriculture, industry and sideline production, the per capita income in Nanhai County, Guangdong, reached an average of 325 yuan last year, an increase by 85 yuan over the previous year. The total output value of the county's communes and brigades reached 840 million yuan last year, an increase by 140 million yuan over the previous year. The county's total grain output in 1980 was 785 million jin, an increase by 86 million jin over 1979. The county delivered nearly 400 million jin of marketable grain to the state. The communes and brigades engaged in diversified economy and ran enterprises and earned 349 million yuan in all last year. [OW180139 Beijing Xinhua Domestic Service in Chinese 0020 GMT 17 Feb 81]

CSO: 4007

## BRIEFS

GRAIN OUTPUT--Despite natural disasters in 1980, Gannan County, Heilongjiang Province increased its grain output. Its people's income also increased. Total grain output reached more than 275 million jin, an 8 percent increase over the 1979 figure and an 18.2 percent increase in its total income. The county's per capita income was 135 yuan, a 13.4 percent increase over the 1979 figure. The bank deposits of the people throughout the county have reached 7.86 million yuan, surpassing the 1979 figure by more than 200 percent. [SK090722 Harbin Heilongjiang Provincial Service in Mandarin 1100 GMT 8 Feb 81]

COUNTY SCIENTIFIC FARMING--Harbin, 9 Feb (XINHUA)--Thanks to scientific farming, Mishan County in Heilongjiang has increased its grain output. In 1980 the county's total grain output and marketable grain sold to the state were both 15 percent more than the previous year and per capita income of commune members increased by 25 percent. [Beijing XINHUA Domestic Service in Chinese 0130 GMT 9 Feb 81 O

COUNTRY GRAIN--Dongning County in Heilongjiang Province reaped a total of 142 million jin of grain and soybeans in 1980, nearly 6.1 percent more than in 1979. Per capita income was 165 yuan, 15 yuan higher than in 1979. [Harbin Heilongjiang Provincial Service in Mandarin 1100 GMT 11 Feb 81 SK]

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## BRIEFS

**AGRICULTURAL PRODUCTION**--Zhengzhou, 14 Feb (Xinhua)--Thanks to the implementation of various systems of responsibility in production, poverty-stricken counties in eastern Henan have increased their agricultural production. In 1980, Taikang County increased its grain output by more than 20 percent, cotton output by 300 percent, edible-oil crops by 40 percent and the head of livestock by some 6,000 and sold to the state 100 million jin of marketable grain, some 30 million jin of cotton and 2.2 million jin of edible oil. Huaiyang County increased its grain output by 100 million jin and sold some 93 million jin of marketable grain to the state. Qixian County increased its grain output by 36 million jin and peanuts by 6.8 million jin. [Beijing Xinhua Domestic Service in Chinese 0719 GMT 14 Feb 81]

CSO: 4007

# SCIENTISTS GIVE VIEWS ON WINTER WHEAT MANAGEMENT

## Symposium Convened

Nanjing XINHUA RIBAO in Chinese 31 Dec 80 p 1

[Article: "How To Intensify Care of Winter Wheat Fields. Experts Attending Provincial Wheat Growing Science Symposium Express Concrete Views"]

[Text] Professors and specialists who attended the wheat growing science symposium convened by the Provincial Agricultural Society proposed technical measures to be taken in caring for winter wheat fields in view of conditions this fall at the time of sowing of the wheat and the present state of wheat seedlings.

The specialists felt that conditions at the time of sowing, and the present growth fo wheat, barley, and naked barley in Jiangsu Province this year were generally good. However, at the time of fall sowing this year, 20 percent of the total area sown to barley, naked barley and wheat had not had applications of organic fertilizer. In many communes and brigades, standards for ditching were not very high and the three kinds of ditches were not linked to form a whole [presumably drainage ditches, irrigation ditches, and furrows for sowing]. Some places did not even bother with ditching. In prefectures north of the Huai, where drought conditions are followed by waterlogging, wheat fields were soggy and seeds rotted. In prefectures south of the Huai, where there was sustained dry weather plus poor quality seeds this year, because some places did not control the seed sprouting rate too carefully, sprouting was very poor this year, and the seedling situation was very unbalanced from one place to another. As a result of their discussions, comrades who attended the symposium unanimously agreed that the greatest problem in the growth of the wheat seedlings just now is poor quality with insufficient sturdiness in the development of individual plants. A fair amount of the early wheat has lost its vitality accompanied by yellowing of third leaves, no tillering of fourth leaves, and a bolting of growth in the fifth leaves. The soggy wheat fields with rotting seeds have produced stunted yellow seedlings. The crudely planted exposed seedlings and intercropped wheat, as well as the wheat sown on hard pan rotatinally cropped fields are facing threat of freeze damage and urgently require work to cover them. In wheat fields intercropped witn wheat, because of the late maturation of the cotton crop and the fairly late pulling up of the cotton plants, the wheat seedlings have bolted in their growth and are now prone to freeze damage.

Wheat seedlings from the wheat that was sown later than it should have been are small and weak, requiring more intensive care. According to meteorological forecasts, this year may see a cold winter with little rain or snow, and this increased difficulties for field care. For this reason, the specialists and professors suggested that every locale further enhance leadership for field care of crops due to ripen in summer, and take into account both the situation in the ecological system of the farmlands and the situation of the seedlings resulting from the way planting was done in the fall to give tailored guidance, adapting general methods to local situations to improve farming techniques as the only means of attaining the goal of large benefits with a saving in labor and a savings in capital.

They felt that what with the recent ever southward movement of a cold wave with a drop in average daily temperatures to about 0°C, plus the lack of precipitation for almost a month, the prospect of drought and freezing has appeared everywhere. Acting on the basis of the moisture content of the soil and the condition of wheat seedlings, each jurisdiction should raise water to combat drought or carry water for watering to increase the capacity of the soil to hold heat, to reduce the temperature spread of the soil, to promote development of the root system of the wheat seedlings, to increase the ability of the plants to resist the cold, and to reduce freeze damage. In prefectures north of the Huai, where winter irrigation is done to combat drought, advantage should be taken of daytime disappearance of the night cold to act quickly so as to prevent freezing of water and killing of seedlings after watering. If temperatures are very low and the land is frozen fast, winter irrigation should not be done.

Some of the early seedlings have lost vitality and are turning yellow. These and the wheat fields where wheat has not come up, as well as the late maturing wheat urgently require additional nutrients, and winter applications of fertilizer should be made at once.

During the period of wintering over, excessive moisture in the fields following rain and snow has to be prevented too. When water accumulates in furrows and cannot get out, the alternate freezing and thawing causes expansion and contraction of the woil which creates "root lifting," and "ice cutting," which kills the seedlings. Therefore, careful attention to the ditching system inside and outside the fields cannot be neglected. Everyone felt that concurrent with attention to freeze prevention should be diligent attention to any changes in the three grains, wheat, barley, and naked barley. General methods should be adapted to local circumstances in caring for these seedlings and action taken as required in each case. Every possible means should be used so that the three different grain crop seedlings will get through the wintering over stage.

## Scholarly Reports Made

Nanjing XINHUA RIBAO in Chinese 31 Dec 80 p 1

[Article by Xiong Baoshan [3574 1405 1472] and Liu Shoutong [0491 1108 2717]: "Provincial Agricultural Society Convenes Wheat Growing Symposium"]

[Text] Professors, specialists and technicians involved in research in the growing of wheat in Jiangsu Province gathered at Zhenjiang from 20 to 25 December to conscientiously explore the laws inherent in the growth, development and output of wheat and their interrelationship with environmental conditions, exchanging academic ideas on this subject. They also proposed some technical measures for field care of wheat during the winter season in terms of the condition of wheat seedlings this year.

Wheat is the principal grain crop grown in Jiangsu Province. During the past several years, wheat production has developed very rapidly in this province and great development has taken place both in growing techniques and in basic theories of high output. As a result of the ultra-left line, however, which created a shortage of researchers, antiquated instruments and equipment, and inadequate funds for research, research has not been commensurate with needs of the modernization of agriculture, and this problem requires immediate solution. Specialists attending the symposium expressed need for gradually establishment of a technical system and a theoretical system for the growing of wheat geared to the characteristics of Jiangsu Province and to which they would devote all their own energies.

This wheat (and barley) growing symposium convened by the Provincial Agricultural Society also invited four professors and researchers from the Chinese Academy of Sciences, Beijing Teachers College, and the Hubei Provincial Academy of Agricultural Science to make scholarly reports on special topics relating to the growing of wheat.

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## JIANGSU

# CONFERENCE ON STATE FARM, LAND RECLAMATION DEVELOPMENT

Nanjing XINHUA RIBAO in Chinese 4 Jan 81 p 1

[Article: "State Farm and Land Reclamation Must Steadily Develop in the Process of Readjustment"]

[Text] Qingjiang, 3 January--"Firmly uphold the policy of readjustment and strive for the steady development of state farms and land reclamation" was the central topic discussed in today's closing session of the conference held by the Provincial State Farm and Land Reclamation Bureau.

The responsible persons of state farms, factories and directly affiliated units earnestly studied RENMIN RIBAO's New Year Day editorial and pledged to further readjust the arrangements for the vigorous development of the livestock industry in the coming year with the steady increase of grain production insured as the prerequisite. Capital construction projects on the state farm and land reclamation front must be substantially reduced and a number of them have to be discontinued. In dealing with industrial enterprises that are run by state farms and have no assurance of raw material supplies, no outlet for their products, and no future, and are operating at a loss, resolute action must be taken to close, suspend, or merge them, or to change their lines of production. These enterprises must also develop the industry of processing agricultural sideline products to turn production, supply and marketing into a coordinated process. In industry, the makeup of products should be reformed through quality improvement, and efforts should be made to conserve energy, to reduce the consumption of raw materials and to increase output. The system of production responsibility should be further improved and labor productivity should be raised so as to turn out more commodities and gain greater economic benefits. Every state farm and factory must strive to make profits and every trade and enterprise must try to avoid losses in 1981.

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JIANGSU

## PRICE CONTROL URGED FOR GRAIN, EDIBLE OIL

Nanjing XINHUA RIBAO in Chinese 10 Dec 80 p 2

[Article: "Market Control Must Be Tightened for Grain and Edible Oil to Stop Illegal Activities--Statement by Provincial Industry and Commerce Administration Bureau on Negotiated Purchases and Sales of Grain and Edible Oil"]

[Text] The Provincial Industry and Commerce Administration Bureau has issued a statement to XINHUA RIBAO correspondents on negotiated purchases and sales of grain and oil as follows:

We have recently received letters from people reporting that some units other than the grain departments are making money under the pretext of market adjustment and in disregard of national food policies. These units bought up huge quantities of grain and oil seeds and then shipped them to other places under the name of "coordination." Some local vegetable or native products companies have also bought up large quantities of peanuts and thus driving up the price and disturbing normal transactions in the country fairs. We are of the opinion that such activities violate State Council regulations and must be stopped.

The CCP Central Committee and the State Council have stipulated in explicit terms: "Negotiated purchases and sales of foodstuffs, including edible fat, oil and oilseeds, are under the unified control of the grain departments." All localities should act in accordance with the spirit of this stipulation. Negotiated purchases and sales of grain and oil should be under the exclusive control of the food departments, and no other unit can meddle in these matters.

The grain departments should also conscientiously observe relevant state policies in purchasing grain and oil in the country fairs at negotiated prices. Grain and oil at the country fairs should first of all be sold to the masses on the principle of catering to each other's needs and adjusting surplus and shortage. These departments can purchase some grain and oil at negotiated prices when the fair is coming to a close, but the negotiated prices for either purchases or sales should be below the country fair prices, in order to even up or keep down market prices.

It is hoped that the departments concerned in various localities will support the industry and commerce administration bureaus in strengthening the control over the grain and oil market in order to stop the illegal activities of driving up prices or speculation and profiteering.

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## CADRES, COMMUNE MEMBERS TO PAY INTERESTS ON DEBTS

Nanjing XINHUA RIBAO in Chinese 20 Dec 80 p 1

[Article: "Beginning from 1981, Cadres and Commune Members Will Pay Interest on Debit Balances as Decided by Yancheng County Party Committee"]

[Text] While stepping up ideological and political work among the cadres and commune members and encouraging them to return their overdrawn funds or to clear the debit balances in their current accounts with their production teams, Yancheng County Party Committee has decided that beginning from 1981, cadres and commune members will be charged interests at the bank's agricultural credit rate for what they owe the production teams in the form of overdrawn funds or debit balances in their current accounts.

Because of lax financial management in some communes and production brigades and teams in Yancheng County during the 10 years of turmoil, the return of overdrawn and misappropriated funds and the settlement of current debts in large amounts have, in many cases, been in arrear. Some cadres and commune members have borrowed from the production teams thousands of yuan for buying bicycles, sewing machines, wrist watches and so forth. The production teams, being short of funds, had to obtain agricultural loans from the banks and to pay monthly interests. This has reduced the commune members' income. Acting in accordance with regulations set by the higher levels, Yancheng County Party Committee has recently decided that: beginning from 1981, cadres and commune members will have to pay interests on what they have overdrawn at the same rate that banks charge on agricultural loans; individual households which are in real hardship can be exempted from the payment of interests, or be allowed a lower rate of interest, only after approval through democratic discussion among commune members of their own production teams.

The announcement of this decision by the county party committee was warmly acclaimed by the commune members and has hastened the return of overdrawn funds and the settlement of debts. Up to now, more than 200,000 yuan of such funds and debts has been returned in the country.

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## JIANGSU

### PLANS FOR DEVELOPING FEEDSTUFF INDUSTRY DISCUSSED

Nanjing XINHUA RIBAO in Chinese 31 Dec 80 p 2

[Article: "Actively Develop Feedstuff Industry To Promote Production in the Livestock Industry; Provincial Planning Committee Convenes Feedstuff Industry Planning Forum"]

[Text] Jiangsu Province's feedstuff industry is gradually growing in size, but it is still a long way from answering the needs of the livestock industry. Henceforth there must be an increase in planning for step-by-step development. Recently the Provincial Planning Committee convened a feedstuff industry planning forum in Qingjiang City, specifically to study this problem.

The industrialization and modernization of feedstuff production to produce balanced feedstuffs in accordance with nutriological prescriptions for livestock and poultry is a major way of reducing required feeding time, conserving feedstuff, reducing costs, and increasing output of meat, poultry, eggs, and milk. Such work has aroused the serious attention of all achelons of leadership in Jiangsu Province during the past 2 years, and it is beginning to be included in the plans of local governments. Over a period of 2 years, Jiangsu Province has invested a total of 8.25 million yuan in the building of 34 balanced feedstuff plants with a total annual output of 100,000 tons, and another 37 are about to go into production. After all have been built, annual output will be 200,000 tons. In addition there are small balanced feedstuff processing plants and processing points operated by communes and brigades in rural villages. In order to develop protein feed sources and to produce feedstuff additives, cottonseed and rapeseed cake detoxification plants and lysine shops have been built at Kunshan, Shazhou, Haian, and Changzhou. In a 2-year period, Jiangsu Province has produced a total of 83,000 tons of balanced feedstuffs for use in feeding hogs, fish, chickens, milk cows, and rabbits. Despite the limited quantity, feeding with it has already shown its superiotity. Results from feeding provided from various places show that use of a balanced feed in place of a single feed can bring 15 to 20 percent increases in benefits from feed, which results in its acceptance by the masses.

Development of the livestock industry places pressing demands on the industrialization and modernization of feedstuff production. In Jiangsu Province, feed grain provided through retention by the collectives and through award sales by the state amounts to more than 7 billion jin. Processing of grain byproducts of various kinds yields another 300 or 400 million jin; cake remaining from processing of oil bearing crops provides 700 million jin, and waste from distillation produces 600 million jin. This almost 10 billion jin of concentrated feedstuff should, according to calculations, produce 5 billion jin of chicken meat or 3 billion jin of pork. In actual fact these quantities have not been attained. A major reason is that the feedstuff industry cannot catch up. In the making of feedstuff, it creates senseless and serious waste. In our province, furthermore, there is a great abundance of animal protein feed sources and stalks, stems, vines, and leaves that could be used as feedstuff. Authorities concerned have pointed out that if each year the more than 20,000 tons of small fish, small shrimp, large quantities of hog blood, silkworm chrysalises, and shells were used, 2 billion jin of balanced feed could be produced, which works out to 200 million chickens or 2 million pigs. If 20 billion jin of stalks, stems, vines, and leaves were processed to make 14 billion jin of chopped fodder, it would feed 1.2 million head of cattle or 28 million sheep, converting vegetation into meat, milk, leather, and wool.

The key to the development of the fodder industry lies in the strengthening of leadership at all echelons in the government for this work, organizing the pertinent departments to cooperate with each other. The guiding idea for use in planning should be to look ahead over the longterm while keeping the feet firmly on the ground in the present, adapting general methods to local situations in active development. In framing programs, the guiding idea should be action according to one's capabilities, using both those of the state and the collective, combining renovation with new construction, doing the easy and simple first and perfecting later to derive econmmic benefits in the shortest possible time.

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## BRIEFS

COTTON PROCUREMENT IN XUZHOU AND HUAIYIN--After achieving a bumper cotton harvest, Xuzhou and Huaiyin prefectures had already overfulfilled their new cotton procurement tasks for 1980. By the end of last December, the total amount of ginned cotton procured in these two prefectures exceeded 1.55 million jin, overfulfilling the original quotas by more than 70 percent, or that of 1979 by more than 100 percent. The increased output, higher prices and improved quality of cotton in 1980 brought the local cotton growers in these two prefectures an additional income of 160 million yuan, averaging over 16 yuan for each grower, as compared with their income for 1979. [Nanjing XINHUA RIBAO in Chinese 8 Jan 81 p 1]

RURAL SAVINGS DEPOSITS--Rural savings deposits in Jiangsu have reached 904 million yuan, a 90 percent increase over the comparable period of 1979, and averaging 17.8 yuan per person in the farming population, or 5 yuan higher than the national figure. In Xuzhou and Huaiyin prefectures, which were poor areas before, the average savings deposits for each person in the farming population registered increases of 116 and 107 percent respectively over those of 1979. [Nanjing XINHUA RIBAO in Chinese 19 Dec 80 p 1]

AQUATIC OUTPUT INCREASED IN HONGCE LAKE--In the first 10 months of 1980, the output of aquatic products in Hongce County was over 17 million jin, a 43.4 percent increase over the same period of 1979, or almost as much as the total output of 1979. This was the result of signing of production contracts between fishery communes and individual fishing boats operating on Hongce Lake, which is under the administrative jurisdiction of Hongce County. [Nanjing XINHUA RIBAO in Chinese 13 Dec 80 p 2]

PRICE OF PLASTIC SHEETS AND INSECTICIDES--Since 1 February 1980, the selling prices of thin plastic sheets and six types of insecticides have been reduced by about 11 percent and 6.6-16.6 percent respectively in Jiangsu Province. Statistics on the total volume of these products sold to the local peasants in the province indicated these price reductions helped local peasants save more than 18.2 million yuan by the end of November. [Nanjing XINHUA RIBAO in Chinese 12 Dec 80 p 1]

CHEMICAL FERTILIZER FOR AUTUMN SOWING--According to statistics compiled on 6 November, over 730,000 tons of chemical fertilizer had been shipped to production teams in Jiangsu for autumn sowing. This is 20 percent more than in the same period of 1979. [Nanjing XINHUA RIBAO in Chinese 7 Nov 80 p 1]

**COUNTY AGRICULTURAL PRODUCTION**--Siyang County in Jiangsu produced 480 million jin of grain in 1980. Both total and per-mu yields of the county's 180,000 mu of cotton crops hit an all-time-high. The county also produced 450,000 jin of edible oil more than 1979. Income from forestry, animal husbandry, fishery and sideline production [illegible] .7 million yuan more than the previous year, representing a 75.5 percent increase. The total output value of agricultural and sideline production increased by 28 percent. The county's per capita distribution was 14.8 yuan more than 1979. [Nanjing Jiangsu Provincial Service in Mandarin 2300 GMT 9 Feb 81 OW]

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## BRIEFS

**GOOD HARVESTS**--In 1980, Nongan County, Jilin, reaped good harvests of sugarbeet and oil-bearing crops. Total sugarbeet output reached 740 million jin, counting 30.7 percent of the total provincial output. Total oil-bearing crops output reached 96 million jin, counting 20.9 percent of the total provincial output. County's total farming income was 220 million yuan, showing an increase by 41 million yuan compared with the 1979 figures. [OW120605 Beijing Domestic Service in Mandarin 2230 GMT 11 Feb 81]

**AGRICULTURAL PRODUCTION**--Changchun, 15 Feb (Xinhua)--Thanks to popularization of agroscience, Dehui County in Jilin has increased its annual grain and soybean output in the past 3 years. The 1978 total grain and soybean output increased 45 percent over 1977, the 1979 total output increased 5.7 percent over 1978, and despite the natural calamities rarely seen in history, the 1980 total ouput increased 1.5 percent over 1979. Last year, the county sold some 387 million jin of marketable grain to the state, overfulfilling the state procurement quota. [Beijing Xinhua Domestic Service in Chinese 0104 GMT 15 Feb 81]

**GRAIN PRODUCTION**--Changling County, Jilin, in 1980 reaped 233,566 tons of grain and 36,500 tons of oilseeds and increased its per capita income by 12.1 percent over that of 1979. The grain output figure was the second best recorded, and oilseed output was a record. [SK192237 Changchun Jilin Provincial Service in Mandarin 1100 GMT 16 Feb 81]

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## LIAONING

### BRIEFS

AGRICULTURAL PRODUCTION--Shenyang, 8 Feb (XINHUA)--The total output of grain in the rural area of Yingkou Municipality, Liaoning Province, exceeded 2.3 billion jin in 1980. The output of cotton, edible oil, fruits and cocoons all increased by more than 15 percent as compared with those of the previous year. The average per capita income of agricultural population in the municipality reached 160 yuan in 1980. As of the end of last year, the total savings deposit of commune members in the municipality reached 54.98 million yuan. [Beijing XINHUA Domestic Service in Chinese 0209 GMT 8 Feb 81 OW]

PADDY RICE--Shenyang, 12 Feb (Xinhua)--Donggou County is taking steps to solve water shortage that seriously affects more than 100,000 mu of the county's 630,000 mu of paddy rice. The county, which has the largest paddy rice acreage among all counties in Liaoning Province, has lost more than 100 million cubic meters of water from its 40-odd reservoirs since last year due to lack of rain. Now some 10 million cubic meters of water has been pumped from the rivers, making it possible for transplantation and watering to be carried out in the eastern area of the county where the more than 100,000 mu of rice paddies suffer the most from water shortage. Other measures are being taken to insure water for the production of the crop. [Beijing Xinhua Domestic Service in Chinese 0059 GMT 12 Feb 81]

CSO: 4007

## BRIEFS

**UNDERGROUND WATER**--Xian, 17 Feb (Xinhua)--The data prepared through six-year exploration by a hydrogeological unit of the PLA Capital Construction Corps indicate that northern Shaanxi Plateau abounds in underground water resources. Water is low in fluoride content. Their rational exploitation and utilization will improve local people's life, eliminate the illness caused by water with high fluoride content and speed up agricultural construction. [Beijing Xinhua Domestic Service in Chinese 0012 GMT 17 Feb 81]

CSO: 4007

## SHANDONG

### BRIEFS

PREFECTURE AGRICULTURE--Jinan, 10 Feb (XINHAU)--Heze, the poorest prefecture in Shandong, increased its agricultural revenues in 1980 by 49 percent over the previous year. The prefectural authorities distributed the prefecture's 1 million mu of sandy and alkaline wasteland to peasants and allowed them to raise draught animals. Last year the prefecture had 420,000 draught animals. The income of each commune member in the prefecture last year doubled, and the total amount of the savings deposits of the prefecture's commune members increased from 30 million yuan to 130 million yuan last year. [Beijing XINHUA Domestic Service in Chinese 10 Feb 81 OW]

COUNTY GRAIN PRODUCTION--Jinan, 7 Feb (XINHUA)--Dongming County which used to depend on resold grain from the state, has become a grain-surplus county. Over 100 million jin of grain is now stored in the county's warehouses. Last year, the county sold more than 70 million jin of soybeans to the state. [Beijing XINHUA Domestic Service in Chinese 0113 GMT 7 Feb 81 OW]

TIMBER FOREST BASES ESTABLISHED--In the past 3 years, 731,000 mu of timber forest bases were established in Shandong to provide more timber for the province. [Jinan DAZHONG RIBAO in Chinese 24 Nov 80 p 1]

COCOON PROCUREMENT--As of 10 November, Shandong had already procured 200,000 dan of silkworm cocoons, overfulfilling its annual state cocoon procurement quota by 10 percent, and setting a new procurement record for the province. [Jinan DAZHONG RIBAO in Chinese 22 Nov 80 p 1]

CSO: 4007

# SHANXI CONTAMINATED FLOUR SCANDAL EXPOSED

## Yunching Prefecture Investigated

Taiyuan SHANXI RIBAO in Chinese 22 Dec 80 p 1

[Article: "It Is Really Hard To Be Tolerant of Endangering the Masses by Contaminating Flour With Mildewed and Rotten Wheat"]

[Text] In a letter, Guan Yunqing [1351 0061 3237] of Yuncheng Prefecture says that an accident due to gross negligence occurred in the eight damp wheat granaries of the prefectural flour mill belonging to the Grain Bureau of the Yuncheng Administrative Office when over 80,000 jin of wheat mildewed and rotted because no one had checked on it in 14 months. This mildewed and rotten wheat contained crooked yellow mold [huang qu meijun: 7806 2575 7199 5497] which is poisonous and cannot be eaten.

Nonetheless, the leaders of the mill feared that the grain transfer depot would trace their dereliction of duty so much that, with total disregard for the health of the people, they mixed the mildewed wheat in with good wheat to make flour. From 17 to 22 September they mixed a total of 12,000 jin of mildewed and rotten wheat with good wheat and contaminated in excess of 379,500 jin of flour. On 29 September they again mixed 20,000 jin of mildewed and rotten wheat with 20,000 jin of good wheat and put it in the water conveyance storehouse.

On the afternoon of 30 September, Comrade Fan Qingtai [5900 1987 1132], head of the Planning and Supply Section of the Administrative Office Grain Bureau went to do an on-site investigation and discovered the seriousness of the problem. Carrying specimens of the mildewed and rotten wheat, he immediately reported to the Administrative Office Grain Bureau. The leading comrades of that bureau, with extreme bureaucratic airs, did not immediately adopt powerful measures to put a stop to this serious problem, with even more dangerous consequences. From 4 October to 5 October, the flour mill took 220,000 jin of wheat which had the mildewed and rotten wheat mixed in and processed it into flour. From 5 October to 7 October they mixed another 40,000 plus jin of mildewed and rotten wheat in with good wheat and milled it. On these two occasions they again contaminated over 750,000 jin of flour.

Originally there were only 80,000 plus jin of mildewed and rotten wheat, but because it was mixed into good wheat, over 1.126 million jin of flour was contaminated. Of this, 1.019 million jin was allocated to the grain transfer depot to trap the masses unawares.

Yuncheng Administrative Office is now investigating and handling this matter.

## Addendum to Investigation

Taiyuan SHANXI RIBAO in Chinese 27 Dec 80 p 3

[Addendum to the Investigation: "On the Investigation of the Matter of the Contaminated Flour"]

[Text] The situation investigated by the reporter for the YUNCHENG BAO is entirely true concerning the incident where the Yuncheng Prefecture's flour mill contaminated flour with mildewed wheat.

On 30 September the mill discovered over 20,000 jin of mildewed wheat in the No 8 damp wheat granary. Some of the wheat stuck on the walls had composted into black mud and some had formed black lumps. The mill director Wei Fenggang [1414 7685 1481] and assistant director Duan Yuqi [3008 3022 3825] did not heed the resolute resistance of comrades in the granary unit such as Yu Senrong [1662 2773 2837] and Cui Quanlai [1518 6855 0171] and, shirking their responsibility, forced the latter to mix the bad wheat in with the good and put it in the granary to make flour. This led to the contamination of more than 379,500 jin of flour.

Later they cleared another 20,000 plus jin of mildewed wheat from the No 6 and No 7 damp wheat granaries, and after adding water to it on 29 September, mixed it in with 20,000 jin of good wheat and conveyed it into two damp wheat granaries.

On 30 September, Comrade Fan Qingtai, head of the Planning and Supply Section of the Administrative Office Grain Bureau became aware of this matter and immediately went to do an on-site investigation. He brought back with him four kinds of specimens of mildewed wheat to show to bureau head Ji Xuewu [0679 1331 2976], assistant bureau heads Wang Hongyu [3769 3163 5148] and Zhao Juquan [6392 6880 0356] and responsible person of the Industrial Section Wang Yurui [3769 3022 3843]. After he saw the specimens, Wang Hongyu ordered Wang Yurui to go to the flour mill to take a look. When Wang Yurui went to the flour mill, the staff and workers had already gone on holiday to celebrate National Day. As a result he did not make a report to the leadership, and the leadership did not order him to make a report.

On 4 October, Duan Yuqi came to the office of the Industrial Section. Wang Yurui asked him, "Did you put the bad wheat into the granary?" Duan answered, "Yes." Wang said, "Did you not know that there carcinogenic toxins in the mildewed and rotten wheat?" Duan answered, "We didn't think about it. We were only afraid that the grain transfer depot would trace our responsibility." Wang said, "Clean out all of the granaries which have not been cleaned out, pack up the bad and set it aside separately, and wait for the matter to be handled. You cannot mix it again with good wheat and put it in the granary."

After Duan Yuqi returned to the mill, he did not do what Wang Yurui had said. The 220,000 jin of mixed good and bad wheat in the two damp wheat granaries had already had water added and been covered for five days. On the 4th and the 5th they took all of it, put in in the granary and made flour out of it.

Following that, they again took all of the over 40,000 jin of mildewed wheat they had cleared out and made it all into flour. In total they contaminated 1,126,050 jin of flour.

There is only a wall separating the Yuncheng Administrative Office Grain Bureau and the provincial flour mill. When this kind of serious matter happens at the mill and not one of the several bureau heads goes over to make inquiries, is it any wonder that monstrous absurdities occur?

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CSO: 4007

SHANXI

## CONSTRUCT WATER CONSERVATION, PROTECTION FACILITIES

Taiyuan SHANXI NONGYE KEXUE [SHANXI AGRICULTURAL SCIENCES] in Chinese No 10 20 Oct 80 pp 2-5

[Article by Xu Sifu [6079 0934 1788] and Li Dafen [2621 1129 0433], Provincial Water Conservancy Department: "Various Problems Connected With Water Conservation and Water Preservation Facilities in the Modernization of Agriculture in Shanxi Province"]

[Text] Modernization of agriculture requires creation of the water conservancy conditions required for modernized agriculture. The present article concentrates on various problems in water conservation and water preservation facilities in the modernization of agriculture in Shanxi Province, putting forward some incompletely thought-out proposals for discussion and consideration.

### I. Modernization of agriculture requires sustained construction of facilities for water conservation and for soil and water protection.

Shanxi is situated in the loess highlands and has a land area of 234.5 million mu. The territory is a checkerboard of mountains and rivers, and the topography is varied. Mountains account for 60 percent of the land area, and cultivated land for only 25 percent. The remainder is forests, meadowlands, and barren mountains or wastelands. (See Table 1 for details) It possesses favorable conditions for overall development of agriculture, forestry, and animal husbandry.

Table 1. Land Use in Shanxi Province (Millions of Mu)

| Item | Total | Cultivated Land | Forests | Meadows | Barren Mountains and Wastelands | Other |
|---|---|---|---|---|---|---|
| Area | 234.5 | 58.85 | 23.6 | 7 | 72.6 | 72.45 |
| Percent | 100 | 25 | 10 | 3 | 31 | 31 |

In the period since the founding of the People's Republic, agriculture, forestry, and livestock raising in Shanxi Province has shown great development over the period immediately following liberation. However, as a result of the sole stress placed on grain production to the neglect of forestry and livestock raising over a long period of time, agriculture, forestry, and livestock raising are proportionately out of balance and natural conditions have not been used to the full.

The concurrent development of agriculture, forestry, and livestock raising is the foremost characteristic of the composition of agriculture in countries with modernized agriculture, and it is the road that most countries or regions must follow in the modernization of agriculture. In Shanxi, as elsewhere in China, the press of population on the land is great, and cultivated land averages only 2.4 mu per capita, most of it concentrated in the basins. Growth in agricultural production depends primarly on increases in output per unit of area, and this requires a supply of adequate water resources for irrigation to attain a consistently high output. Requiring special consideration is the fact that Shanxi Province will be China's most important base for coal energy in the future, and that the modernization of industry, with an accompanying great increase in the population of industrial and mining cities and towns, not only will require the supply of more commodity grain, but will also require that more water be provided for production and daily life. Development of the forestry and livestock industries will also require the preservation of water and soil in mountain regions and the creation of conditions necessary to water conservation. Water conservation departments estimate that the quantities of water needed for agriculture and in the daily life of cities and towns will be very great in both the short term and the long term (see Table 2 for details), while natural conditions have two outstanding characteristics--namely, insufficient water resources to meet needs, and severe erosion.

Table 2. Estimated Water Needs for Agriculture and City and Town Life in Shanxi (in billions of cubic meters)

| Year | Total | Agriculture | Industry | City & Town Life |
|---|---|---|---|---|
| 1978 | 5.92 | 5.16 | .54 | .22 |
| 1985 | 7.2 | 5.6 | 1.15 | .45 |
| 2000 | 13.91 | 9.55 | 3.59 | .77 |

In Shanxi Province, precipitation is scant and unevenly distributed. Usable water resources are extremely limited. Average precipitation throughout the province has averaged 535 millimeters, and surface runoff is 11.68 billion cubic meters, for an average runoff of 750,000 cubic meters per square kilometer. Annual per capita consumption of water is 477 cubic meters. The volume of water used on farmlands averages 198.5 cubic meters per mu. These figures are 28.5 percent, 17.3 percent, and 11.3 percent, respectively, of the national average values, and are very much lower than average national levels. Differences are great from one year to another in both the amount of precipitation and the volume of surface water. In a year of abundant precipitation, the maximum was 710 millimeters (1964), while in a dry year, precipitation amounted to only 392 millimeters (1972). In a year of abundant precipitation, maximum annual runoff was 19.74 billion cubic meters (1956), and in the driest year, annual runoff was 6.35 billion cubic meters. The distribution of precipitation and the volume of runoff are uneven throughout the year. Mostly they are concentrated between July and September, when from 60 to 80 percent or more of the total annual amount occurs. There is also a great disparity in the distribution of surface water volume from one region to another, with basin areas having 40 percent of the total volume while the western mountains get only 25.1 percent. Runoff per square kilometer is greatest in the eastern mountains with 94,300 cubic meters, and least in the western mountains with 55,000 cubic meters. It is also in the eastern mountains where the volume of water for cultivated land is greatest, averaging 392.3 cubic meters per mu. The basins get the least amount, averaging 141.5 cubic meters per mu. Per capita volume of water is also greatest in the eastern mountains, amounting to a maximum of 842 cubic meters, and least in the basins, amounting to 297 cubic meters.

Subterranean water resources account for a large proportion of total water resources in the province, but no firm figures are available. It is estimated that with the duplicatory surface water deducted, subterranean water resources throughout the province would amount to 5.55 billion cubic meters. Water resources from all sources throughout the province total 17.23 billion cubic meters. At a future date, about 10 billion cubic meters of water resources can be developed throughout the province, of which surface water would amount to about 6.1 billion cubic meters and subterranean water 3.9 billion cubic meters, which is about 4 billion cubic meters short of needs.

During the early period following liberation, the area of soil erosion in Shanxi Province amounted to about 142 million mu, or 60 percent of the land area. The average erosion modulus for the province was 2,920 tons per square kilometer, for an annual transported volume of silt amounting to 456 million tons. Erosion was most severe in the western mountains, with the erosion modulus reaching as high as from 10,000 to 15,000 tons per square kilometer, or an average 8,322 tons per square kilometer, with 294 million tons of silt being carried to the Yellow River annually.

Water resources are scant and unevenly distributed in Shanxi Province. The mountain areas are large and erosion is severe, with the result that 9 out of 10 years are dry and drought disasters are frequent, posing a major threat to agriculture, forestry, and livestock production. In order to meet the overall development needs of agriculture, forestry, and livestock raising, during the process of modernizing all agriculture there must be a sustained construction of facilities for water conservation and water preservation. Should there be any relaxation in this effort, the progress of agricultural modernization will surely be impaired.

## II. Major accomplishments and problems in construction for water conservation and water preservation in Shanxi Province

During the 30 years since the founding of the People's Republic, the people of Shanxi, under the leadership of the party and the government, have made outstanding achievements in constructing water conservation and water preservation facilities on an unprecedented scale (see Tables 3 and 4).

Table 3. Water Conservation Accomplishments in Shanxi Province (millions of mu)

| Year | Irrigated Land | Including | | | | Prone to Floods | Saline & Alkaline Soil |
|---|---|---|---|---|---|---|---|
| | | Natural Flow | Well Irrigation | Machine & Power Irrigation | Small Facilities | | |
| 1949 | 1.54 | 1.03 | .227 | -- | .283 | 1.644 | 4.823 |
| 1979 | 14.273 | 5.829 | 4.161 | 3.499 | .784 | .462 | 2.512 |

Table 4. Water Preservation Accomplishments in Shanxi Province (millions of mu)

| Place | Eroded Area | Preliminarily Controlled Area | Proportion Under Control (percent) | Including | | |
|---|---|---|---|---|---|---|
| | | | | Afforestation | Grass Planting | Terraced, banked beached & walled lands |
| Province | 142 | 47.56 | 33.5 | 25.11 | 1.97 | 20.48 |
| Eastern mountains | 45 | 17.9 | 39.8 | 4.5 | .75 | 12.65 |
| Western mountains | 47 | 13.5 | 28.7 | 5.66 | .58 | 7.26 |

Benefits from construction of water conservation and water preservation facilities are multiple benefits, manifested first in an increase in the irrigated area. Currently, the irrigated area throughout the province is 14.27 million mu, or 24.2 percent of the total cultivated area, for an average of 0.59 mu per capita. In mountain areas, there are 20.48 million mu of terraced, banked, beached, and walled lands, or 0.84 mu of such lands per capita. Benefits are manifested secondly in the present virtual harnessing of rivers, greatly decreasing disasters from flooding and waterlogging. There have been virtually no provincewide or prefecturewide large floods or waterlogging disasters. Third, 46 percent of the lands prone to waterlogging and alkalinization have been brought under control for the advancement of agricultural production. Fourth, difficulties of more than 5 million people in mountain areas in getting drinking water have been solved. Additionally, the problem of supplying more than 700 million cubic meters of water to the industrial sector and to the people of cities and towns has been solved.

Major problems existing in the construction of water conservation and water preservation facilities are as follows:

1. The control of surface water resources is poor, and the utilization rate is low. Silting has taken up 1 billion cubic meters of the 4.2 billion cubic meter total capacity of the more than 900 reservoirs throughout the province. When an additional capacity is deducted for flood control, actual storage capacity is only 1.8 billion cubic meters, or 15.4 percent of the volume of surface water. The average annual use of surface water throughout the province has been only 1.82 billion cubic meters over the years, which is 15.6 percent of the annual runoff. Subterranean water has been tapped for 2.34 billion cubic meters, which amounts to 42.2 percent of the natural resources. The volume of water for use as a result of control of the 5 major rivers in the province is about 35 percent of the annual amount of runoff. Each year another 4.56 billion cubic meters of water runs away without being put to use.

2. Projects are poorly equipped, the quality is poor, and waste of water is serious. Of the 60 large and medium-size reservoirs throughout the province, 44 are unable to impound water normally. Most of the almost 1,000 small reservoirs also fail to meet flood prevention standards, and the quality of their construction is poor. Losses on the projects and abandonment have been serious. Since 1974, investment on water conservancy in Jinzhong Prefecture has amounted to almost 100 million yuan spread over more than 40 projects, not one of which is completely equipped. Designed to benefit 646,000 mu, they are now able to serve only somewhat more than 10,000 mu. Only 62.7 percent of the irrigation and drainage ditches in the 6 large natural-flow irrigation areas throughout the province are fully equipped, and only 28.6 percent of the structures are fully equipped. Of the 915,000 kilometers of fixed irrigation ditches, only 269,000 kilometers, or 29.4 percent, do not leak water. In 1978, of the 126 natural flow irrigation areas throughout the province, 89 areas, or 70.5 percent of the total number of irrigation areas, used more than 100 cubic meters of water per mu each irrigation period. The average was 107.8 cubic meters, which is a great waste of water.

3. There has been a lot of blundering in the development of subterranean water. Too many wells have been sunk, too many have been abandoned, costs have been high, and benefits low. In the 7-year period from 1973 to 1979, 96,100 new wells were sunk, while during this same period 59,500 wells were either abandoned or replaced. During the 7 years, the net increase in wells was 36,600 at an average cost of 8,080 yuan per well. Figuring that a single well can irrigate 76.9 mu, the cost per mu was 300.40 yuan. Because of uncertainty about subterranean water resources and a lack of unified planning, a lot of blind tapping has been done, and sometimes overtapping has caused a lowering of the water table over wide areas. A great decline has occurred in the subterranean water table over an area of almost 2,000 square kilometers in the Sushui River basin in Yuncheng Prefecture. The maximum decline has been 54 meters.

4. Competition for water between industry and agriculture becomes increasingly sharp, and pollution of water resources becomes ever more serious. At the present time, agriculture uses about 160 million cubic meters of water annually, and industry uses about 540 million cubic meters, respectively a 10-fold and 27-fold increase since the period immediately following liberation. Industrial use of water now accounts for 10 percent of the total used by agriculture and industry together. In the wake of the construction of coal energy bases and the development of industrial production, industry's proportion of water use will rapidly increase. City and town residents currently use 220 million cubic meters of water annually, and usage will continue to increase. Meanwhile, a uniform approach to water resources is lacking, and in the construction of water conservation facilities there exists a phenomenon of giving exclusive consideration to agriculture. At the same time, industrial waste of water and sewage from the cities are gradually increasing, with pollution of water resources becoming increasingly severe. Additionally, problems exist in the rapid development of the irrigated area. Power is seriously inadequate; protection of water and soil tends toward engineering measures; the speed of control is not fast enough; and water conservancy project management work is weak, thus making it impossible to derive full benefit from projects. The cost of water conservation projects becomes increasingly high, while the benefits derived from investment become increasingly fewer.

## III. Some ideas for hastening construction of water conservation and water preservation facilities in Shanxi Province

During this new period of socialist modernization, Shanxi Province's water conservation and water preservation projects must see a genuine unification of leadership and centralization of management, perseverance in doing things in conformity with natural laws and economic laws, and attention to the several following characteristics, with definition of the following serveral principles:

1. Shanxi Province is China's major energy base for coal. Concurrent with the building of water conservationand water protection facilities, and when thinking about the modernization of agriculture, full consideration must be given requirements for building an energy base with equal emphasis on the water needs of agriculture, industry, and daily life in industrial and mining cities and towns. In constructing for energy, full consideration has to be given also to energy resources' demands on water conservation.

2. In the construction process, there must be adherence to the principle of equal emphasis on construction in mountain regions and construction in the basins, to construction of water conservation facilities and to construction of water preservation facilities. The basins are paramount for agriculture and should be the focus of the construction of water conservation facilities. The mountain regions are paramount for forestry and livestock raising, and should be the focus of the construction of water preservation facilities.

3. In the short term, construction for water conservation should give equal emphasis to the tapping of resources and to reducing runoff, with all possible water resources that can be used being impounded, transferring water across

drainage basins as needed, using every manner of means to conserve water, vigorously increasing the water resources utilization rate in Shanxi Province, and not slackening preparatory work for the diversion of the Huanghe into Jindongnan Prefecture.

4. Forty percent of the usable water resources in Shanxi Province consist of subterranean water, of which 50 percent is in the basins. Therefore, construction for water conservation must follow the principle of equal emphasis on surface and subterranean water with overall planning and joint development of both surface water and subterranean water.

5. The construction of a large number of key water conservation projects in Shanxi Province during the past 30 years has laid a fairly good foundation for water conservation, but many equipment problems remain, and a substantial amount of untapped potential remains in existing water conservancy facilities. Therefore, for the near future, construction of water conservation facilities should emphasize equipping existing facilities first of all, followed by construction of new facilities--a concentration of forces to make existing projects effective and to start preparatory work for new facilities at the same time.

Specifically, the following views are submitted:

1. Take firmly in hand the construction of key projects. Once benefits are derived from the equipping of existing projects, emphasis should go to construction of key projects for the five major rivers in the province. The average annual runoff from these 5 rivers amounts to 7.02 billion cubic meters of water, of which 70 percent is still not presently being controlled for use. Insofar as national financial resources and local labor forces permit, there should be planned construction of a group of water reservoir projects and water diversion projects so as to gradually increase diversion and storage capacity. It is estimated that if 2 billion cubic meters of water could be brought under control for use in getting the water utilization rate to reach 60 percent, it would be possible to greatly ameliorate the current water shortage. Capital construction will require better management of construction to increase the quality of projects. Key and ancillary projects must be laid out at the same time, so that benefits will be derived all at once upon completion.

2. Rationally develop the use of subterranean water. There should be greater centralization of leadership, establishment of a special team for subterranean water prospecting and design work, the setting up of well engineering companies, reform of the system whereby every county has well teams, strict control over the sinking of deep wells, and unified control in areas irrigated from wells. Forces should be quickly organized to launch a survey of subterranean water resources on a provincewide scale to determine tapable water reserves. Experimental research should be done on underground catchments and return of water used for irrigation for a gradual joint development and multiple use of both surface and subterranean water. There should be rapid establishment and strengthening of an organization for research on subterranean water with vigorous launching of research on the development and utilization of subterranean water. A network of stations should be set up to observe the movement of underground water in order to provide data for scientific management and the use of subterranean water.

3. Vigorously proselytize the conservation of water. This is the primary action to be taken to solve the shortage of water resources in Shanxi Province. All irrigation districts should continue to take in hand the completion of irrigation systems, the prevention of leaks in irrigation ditches, the leveling of the land and preparation of the soil, and garden-style cultivation of the land. Fixed irrigation and drainage ditches should gradually be replaced with pipe. There should be planned extension of new irrigation techniques such as spray irrigation, drip irrigation, and ooze irrigation in an all out effort to conserve on use of water. Policies should be formulated for awards for water conservation, and industrial systems should also formulate concrete means to conserve the use of water.

4. Undertake key construction in six major basins. Half of Shanxi's water resources and cultivated land is concentrated in six major basins which are the province's major grain- and cotton-producing areas and which should be the future key construction sites for water conservancy projects so as to transform them into agricultural bases with consistently high output. Construction of water conservation projects in the basins should take into consideration the characteristics of each of the basins. Water conservation conditions in the Yanbei basin are better than most, but saline-alkali soil is a serious problem. In this basin, 1 8 million mu or 24.6 percent of the cultivated land area consists of saline-alkali soil. This amounts to 68.7 percent of the saline-alkali soil in the entire province. Yanbei Prefecture will be a major coal base of the future, but solution of its commodity grain problems requires changing the alkalinity of the soil. The priority tasks for water conservancy construction in the Xinding basin are construction of a project to impound water in the dry watercourse of the Hutuohe, an increase in transfer and storage capacity, and concurrent equipping of irrigation and drainage projects, with attention paid to improvement of salt and alkali going into wetlands. The main problems in the Taiyuan basin are a shortage of water, sluggish drainage of water, and low output from wetlands. There must be continued construction of a series of water catchment projects, planned tapping of subterranean water, full use of industrial wastewater and wastewater from urban areas, combined with vigorous conservation of water, improvements in the ditch system for drainage and receding of water, realignment of the dry bed of the Fenhe, and control of salinization and alkalinization from waterlogging. In the Linfen basin, water resources are more copious than elsewhere. There is need for improvements in the management and use of existing water conservation facilities, and upgrading of existing standards for wetlands, and concurrent construction of a project for diverting the Qin into the Fen to solve the problem of insufficient water resources in the eastern part of the Fen. In the Yuncheng basin, construction must continue on the major irrigation station for diversion of the Huanghe to supplement available water resources, while at the same time vigorous efforts must be made to conserve water and to do a good job of building up the shores of the Huanghe. In the Shangtang basin in Jindongnan Prefecture, the main task is to upgrade the irrigation region to enlarge the areas served. In the Zezhou basin, good work has been done in readying a project for diverting the Qin into the Dan.

5. Do a good job of water and soil preservation, principally using biological measures. In mountain areas, water and soil preservation must be done primarily through biological measures, with engineering measures playing an auxiliary role. The use of engineering measures alone cannot fundamentally transform the damaged plant cover or extend cultivation, and they are not active measures for protecting the water and soil from the vicious cycle of increasingly serious erosion. Large-scale biological measures centering on forestry and livestock raising are effective measures for preserving both the water and the soil, and they constitute the road that mountain regions must take to go from poverty to riches. The key to speeding up the building of forests and grasslands and shortening the transition primarily to forestry and livestock raising lies in a proper solution to the problem of self-sufficiency in grain. Self-sufficiency in grain should be carried out, first of all, from the standpoint of the entire province, with the emphasis on increasing output per unit of area from cultivated flat land areas and on production of more commodity grain. For mountain areas, such as the western mountains and other places where erosion is severe, there should be no blanket requirement for self-sufficiency in grain, and there should be separate proportional grain self-sufficiency requirements and exemption from requisition purchases of grain set on the basis of natural conditions.

6. Improve the unified management of water resources throughout the province. In this connection, the establishment of a Shanxi provincial water resources management commission under the leadership of the provincial people's government is proposed in order to handle the planning, development, use, and protection of water resources and to arbitrate conflicts over the use of water throughout the province.

7. Unify the management of water conservation project facilities. Management personnel at newly constructed water conservancy projects should be part of an overall national system, and at each water conservancy project a gradual modernization of management and a more businesslike management should take place.

8. Truly enhance scientific and technical work in water conservation. First of all there should be a reform of the organizational structure for scientific and technical work, in order to overcome the current situation in which scientific and technical personnel are few and dispersed. There should be vigorous training and nurturing of scientific and technical personnel for water conservation, establishment and perfection of a system of responsibility for technicians at all echelons, vigorous promotion and introduction of advanced science and technology, and constant upgrading of the level of science and technology in water conservation.

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CSO: 4007

SHANXI

## PRODUCTION RESPONSIBILITY SYSTEM BRINGS HOPE TO DISASTER-PRONE PREFECTURE

Taiyuan SHANXI RIBAO in Chinese 22 Dec 80 p 1

[Article by You Bin [3945 3453], Hong Cai [1347 2088], Zhang Jun [1728 6511], Huai Bi [2037 3880], Sheng De [3932 1795] and Xing Fu [5281 1381]: "The Masses of Lüliang Prefecture Are Jubilant at Having No Disasters in a Disaster Year"]

[Text] Lüliang Prefecture has implemented various forms of production responsibility systems which have played a very great role in promoting the development of production and reducing this year's losses due to natural disasters.

There is a large number of poverty-stricken mountain districts in Lüliang Prefecture. Over eighty percent of the prefecture is remote mountain areas. Since cooperativization, the amount of grain held by the peasants and the level of distribution of benefits to them have been the lowest in the province. This is particularly so in the nine mountainous xian, where in the past the livelihood of the masses was half-starving half-full in good years, and in disaster years many people wandered destitute far from home and even begged for food. From 1971 to 1979, the prefecture ate a total of over 669 million jin of resold grain from the state. But this year the situation changed enormously. Even though there was minimal precipitation last winter, the spring temperatures were freezing, there was no rain going into summer or during the dog days of summer, and drought and frost again appeared in the autumn--a set of natural disasters exceeding those of the great drought year of 1972--the total output of grain still reached more than 1.29 billion jin. Although this was a reduction from the previous year, it was 300 million jin more than in 1972. The total output of cotton reached 4.22 million jin, one-tenth greater than in the bumper year of 1979. Total output of oilseeds was over 16.9 million jin, 85 percent greater than last year and reaching the highest level in the 10 years since the prefecture was established. The per capita distributed income in the prefecture may reach 60 yuan. Right now there is sufficient grain on the market and prices are stable. Some varieties are priced at levels below the state list prices. Various kinds of dry and fresh fruit and vegetables are also relatively abundant. It is a prosperous scene.

The main reason that this scene can appear in a year of major disasters is the implementation of the spirit of the Third Plenary Session, breaking through the ultraleftist forbidden zone of "large, public, equal and poor" to carry out variform production responsibility systems. In the main, five kinds of production responsibility systems were in operation this year in the villages of Lüliang Prefecture. These were contracting work to small sections, remunerating according to norms; uniting production to the group, with individual responsibility; uniting production to the laborer or household; contracting operations to the group; and contracting operations to the household. Practice has shown that carrying out various kinds of production responsibility systems in light of local conditions is an effective measure in mobilizing the activism of the masses and in transforming the poverty of the mountainous areas. Output fell in Liulin Xian, but it was up by 20 percent over last year in that xian's Zhangjia Getai Commune after it carried out a production responsibility system of uniting production to the group. Pingtou Commune in Lishi Xian carried out a responsibility system of dividing groups according to oxen, managing on the basis of the household, uniting production to the laborer and full rewards and full assumption of losses. Although production fell in the xian, the commune had its best harvest ever, with 100,000 jin more grain than last year. Zhaojiashan Brigade in that commune had eaten over 500,000 jin of supply grain in 12 years in the period since cooperativization. Up to last year, the value of a work point was only 0.25 yuan and per capita distributed income was 27 yuan. This year, this brigade of 185 households, under the preconditions of unified accounting, unified operations and unified distribution, carried out a responsibility system of uniting production to the laborer or household, and in one year made a great turnaround. Total grain output leaped from 27,000 jin last year to more than 48,000 jin, an increase of 75 percent. Income increased by 20 percent and production expenses fell by 30 percent. Last year they ate supply [grain]; this year they sold surplus grain. With only two exceptions, all 160 households of commune members which had production contracted to them increased their output. According to incomplete figures from the nine mountainous xian, over 1,300 production teams which had set up production responsibility systems cast off the brand of eating supply grain. The masses of Lüliang's mountainous districts say: Whether or not we pass the stiffest test is in the scales after the autumn. If there were no responsibility system, where would the good year be? Responsibility systems uniting output and compensation to the group, the laborer or the household are a good thing.

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## BRIEFS

**SHANXI TAX REDUCTION**--This year agricultural production in some of our province's xian and municipalities suffered from natural disasters of different degrees of magnitude. In order to reduce the burden of the peasants in the disaster areas, the Ministry of Finance, with the agreement of the State Council, has decided to lower our province's agricultural tax burden by 10 million yuan. The provincial Department of Finance has acted according to the principles of greater reduction for serious disasters, less reduction for lighter disasters and making use of key points to put forth a distribution plan according to the actual disaster conditions of each area. With the approval of the provincial people's government, it has recently been communicated in its entirely to the prefectures and municipalities which have been affected by disaster, with the requirement that each locality rapidly set the reduction targets all the way down to the disaster-stricken production teams. This is the solicitude of the party and government for the people of the disaster areas. [Text] [Taiyuan SHANXI RIBAO in Chinese 26 Dec 80 p 1] 11723

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## BRIEFS

LARGER RAPE ACREAGE PLANNED--According to late-autumn sowing plans formulated in various areas of Sichuan, the total acreage to be planted to rape this late autumn will be about 1.5 million mu larger than the rape acreage actually harvested in 1980. This enlarged rape acreage is partly responsible for the reduction of wheat acreage planned. [Chengdu SICHUAN RIBAO in Chinese 7 Nov 80 p 1]

LATE AUTUMN SOWING COMPLETED--Late autumn sowing has been completed in Sichuan. The wheat acreage was reduced, while rape acreage, enlarged. The total acreage actually planted to wheat was 30.8 million mu, or 1.8 million mu less than the wheat acreage actually harvested in 1980. This reduction will increase the need of raising the per-mu yield of wheat and will make it more difficult to realize the plan for increasing the output of winter crops in 1981. Moreover, rainy weather and a shortage of sunshine have caused some difficulties in draining and plowing the fields and in applying fertilizer. Fine strains of seeds were used this autumn on about 80 percent of the wheat crop and on about 85 percent of the rape crop. Over 80 percent of the wheat crop was sown between the last 10 days of October and the first 10 days of November, 7 days earlier than in 1979 in most areas. As to the rape crop, over 90 percent was planted before 22 November, a whole season earlier than in 1979. [Chengdu SICHUAN RIBAO in Chinese 20 Dec 80 p 1]

CULTIVATION METHOD FOR HYBRID RICE--Further experiments and demonstrations on cultivation methods for intermediate hybrid rice proved to be highly successful this year at eight selected production teams in Guanghan County, Sichuan. These experiments and demonstrations were conducted on a total of 700 mu of land in these teams that had signed contracts with the provincial Agricultural Academy and the county's Agricultural Bureau. The per-mu yield from the 700 mu in the autumn harvest was 1,050 jin, a net increase of 80 jin over that of 1979. These demonstrations also helped boost the per-mu yield of the 70,000 mu of intermediate hybrid rice grown by others in the county to more than 980 jin, about 40 jin over and above that of 1979, or 150 jin over that of the conventional rice. [Chengdu SICHUAN RIBAO in Chinese 20 Dec 80 p 2]

GRAIN OUTPUT--Chengdu, 18 Feb (Xinhua)--The total 1980 grain output in Zhongjiang County, Sichuan Province, reached 940 million jin, including over 340 million jin of paddy rice. This total grain output marked an increase of over 130 million jin over 1979. The county's per-mu yield of paddy rice in 1980 broke 1,000 jin for the first time in history--a record 1,042 jin. [Beijing Xinhua Domestic Service in Chinese 0156 GMT 18 Feb 81]

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## BRIEFS

LIVESTOCK PRODUCTION--Shache County of Xinjiang Uygur Autonomous Region increased livestock production in 1980. There were a total 640,000 head of livestock last year as against 595,000 in 1979. Last year 477 dun of meat were supplied to the market, or 37 dun more than the present target, while the income from animal husbandry was 37 percent higher than the 1979 level. [Urumqi Xinjiang Regional Service in Mandarin 1300 GMT 12 Feb 81]

SHEEP PRODUCTION--Urumqi, 13 Feb (Xinhua)--With only 10 percent of the total number of animals in the whole of Xinjiang, Altay Prefecture in 1980 was the source of 40 percent of the region's market meat supply. This resulted from the prefecture's reform of its animal husbandry. During the chaotic decade, the number of animals in the prefecture remained at around 2.6 million each year. By 1980 the number reached 3.27 million. The reform calls for a departure from the past habit by raising wethers to maturity and slaughtering them the same year instead of keeping them for the sake of a higher head count the next year. This method cuts down the consumption of fodder grass and the labor involved, while increasing the number of animals available for the market. In 1978 the prefecture contributed only 80,000 sheep for slaughter. In 1979 the number increased to 190,000 and in 1980 it reached 260,000. Because of sufficient fodder grass left, the number of ewes has raised from less than 50 percent of the total sheep on hand in the past to 65 percent, making it possible for the prefecture to register the nation's highest breeding rate of 45 percent. [Beijing Xinhua Domestic Service in Chinese 0049 GMT 13 Feb 81]

COUNTY LIVESTOCK--Xinjiang's Yecheng County has improved livestock breeding by increasing the number of fertile dams. The number of livestock reached 567,000 by the end of 1980, over 10 percent increase over a year ago. [Urumqi Xinjiang Regional Service in Mandarin 1300 GMT 5 Feb 81 OW]

GRAIN OUTPUT--The grain output in the Youth Company of the 105 Regimental Farm in the Changji Hui Autonomous Prefecture, Xinjiang, reached 1.98 million jin in 1980 with an average of 20,000 jun produced by each person in the company. The company's per mu yield of wheat in 1980 reached 400 jin. [Urumqi Xinjiang Regional Service in Mandarin 1300 GMT 8 Feb 81 OW]

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## BRIEFS

AGRICULTURAL PRODUCTION--Lhasa, 8 Feb (XINHUA)--The total output of grain and oil-bearing crops in Xigaze Prefecture, Xizang, reached 357.38 million jin in 1980, increasing by 14.4 percent as compared with that of the previous year. The total number of livestock in the prefecture also increased by 20 percent compared with the previous year. Xigaze Prefecture ranks first in grain production and second in livestock raising in the autonomous region. [Beijing XINHUA Domestic Service in Chinese 0018 GMT 8 Feb 81 OW]

COUNTY DISTRICT PRODUCTION--(Bayi) District of Nyingchi County in Xizang Autonomous Region produced 2.18 million jin of grain last year, an increase of 0.19 million jin over 1979. The total income earned by the district from sideline production for 1980 was more than 0.41 million yuan, topping that of the year before by 90,000 yuan. As a result of the all round development, each person in the district was allotted 630 jin of grain and 252 yuan from all sources of income. [OW120615 Lhasa Xizang Regional Service in Mandarin 0015 GMT 11 Feb 81]

AFFORESTATION CIRCULAR--Xizang Autonomous Region will strive to build ecological, shelter and economic forests this year. In a 3 February circular the regional people's government calls for area afforestation totaling 32,900 mu plus 4 million trees in marginal land by the sides of houses, villages, roads and rivers and the like for 1981. In addition, the region will also build economic forests consisting of walnut trees and the like and open up 1,485 mu of sapling nurseries. All trees will be the property of the planting unit, whether it is a rural production brigade, an office, a PLA unit, a factory or mine or an individual commune member. To encourage afforestation, the government will offer a subsidy of 30 yuan for each mu afforested, 70 yuan for each mu of nursery opened and 1 yuan for each walnut, tong oil or other such tree grown. [Lhasa Xizang Regional Service in Mandarin 1130 GMT 18 Feb 81]

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YUNNAN

## PRACTICAL ACTIONS LEAD TO INCREASED LIVESTOCK PRODUCTION

Kunming YUNNAN RIBAO in Chinese 8 Jan 81 p 2

[Article: "Yunnan Province Made Gains in Livestock Production Last Year; Liberalization of Policies Makes Most of Advantages"]

[Text] Last year livestock production in Yunnan Province showed new growth and development with the number of cattle on hand totaling nearly 27 million head, an increase of almost 300,000 head over the previous year. Large animals increased by more than 90,000 head, and sheep increased by more than 360,000 head for the largest increases since 1965. Average weight and quality of fattened hogs increased strikingly.

Last year livestock production in Yunnan Province advanced despite the serious natural disasters to agriculture of the year before. Usually in the past when agriculture confronted disasters in one year, livestock production in the following year would suffer. A very major reason why livestock production showed an increase in our province last year was the implementation of a series of practical actions fitted to livestock production in Yunnan Province, plus readjustments in the structure of agriculture, forestry, and livestock raising, which saw downward readjustments in the excess grain requisition purchase quotas for forestry and livestock raising areas. In addition, every commune and production brigade operated in accordance with natural and economic laws, and set production programs by adjusting general methods to local situations to make the most of advantages in doing a good job of livestock production. Throughout the province, more than 8,100 production teams established programs in which livestock were paramount. Dahai Commune in the high and cold mountains of Huize County has historically been a place where sheep raising has been paramount, but during the past several years both natural and economic laws have been violated. On an area totaling 280,000 mu, no heed was given to making the most of advantages offered by more than 220,000 mu of grass covered mountains and more than 30,000 mu of forestlands; instead emphasis went only to the growing of grain on more than 22,000 mu of farmland. As a result, during 1977, there were only 20,743 head of sheep in all the communes of the county, a 1.9 percent drop from 1966, and grain output also dropped year by year. Last year after setting a program in which livestock was paramount, the focus of work in the commune CCP committees switched to livestock production and both agriculture and livestock raising registered increases in output. Last year, sheep on hand numbered 31,900 head for a 28.9 percent increase over the previous year. More than 90,000 jin of wool was produced, a 12 percent over the previous year, and more than 3,000 sheep were slaughtered. Grain output totaled 8 million jin, a 10 percent increase over the previous year, and for a 2.3 percent increase over 1973, which was the highest year on record.

At the same time, the entire province directed close attention to the implementation of livestock industry policies, holding fast to simultaneous rises in hog, cow, and sheep production, simultaneous advances for mountain and flatland areas, and simultaneous advances for the state, the collective, and individuals. Featured was the diligent implementation of simultaneous programs for livestock raising by communes and by private individuals, encouragement and support to livestock raising by commune families with no restrictions on kinds of livestock or their numbers, plus adoption of various measures to help commune members solve the problem of where to get animal fodder, which greatly advanced the development of livestock industry production. At the present time, of the nearly 27 million head of livestock in the province, 1.23 million have been privately raised, a 23 percent increase over the end of the previous year, and amounting to 16.8 percent of the total livestock on hand. Privately raised large livestock animals number 510,000, an increase over the previous year of more than 134,000 head and 7.8 percent of the total livestock on hand.

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## NEED FOR CAREFUL SELECTION OF PINE SEEDS DISCUSSED

Kunming YUNNAN RIBAO in Chinese 8 Jan 81 p 2

[Article by Shu Xiaowu [5289 2556 2976], Provincial Forestry Institute: "Planting of Pine Forests in Yunnan Requires Selection of Good Seeds"]

[Text] Every year the period from December to February and March is a good time for collecting the seeds of the Yunnan pine. The collecting season is now upon us, and everywhere the collection of Yunnan pine seeds is now actively underway, which is fine. But our investigations show that in many places no distinction is made between superior and inferior seeds in the collection process. When a pine cone is sighted, it is picked, and if it contains seeds, they are collected and then planted when needed. There is need for greater care.

Yunnan pine may be divided on the basis of quality into the superior straight trunk pines and the inferior quality gnarled pines and squat pines. No matter the kind of Yunnan pine, the shape of their trunks is transmitted genetically through the seeds to the next generation. According to a survey conducted in part of the forestry area of Chuxiong Zhou by the Chinese Academy of Forestry and the Yunnan Forestry Institute, 44.4 percent of the pine trees in the forest have straight trunks, and the natural renewal rate of straight trunk pines in slash areas is 55.5 percent, while the rate for straight trunk pines through human efforts is only 6.4 percent. Most trees planted by humans are gnarled pines or squat pines. One of the reasons for the serious decline in the quality of this variety of pine is the fondness of forestry business enterprises and communes and brigades for felling the good and leaving behind the bad when cutting Yunnan pine. As a result large numbers of twisted and gnarled pines spread in the timbered areas and the squat pines propagate themselves. Another reason is that in many places, commune members do not select superior parent trees from which to gather seeds at seed collection time, instead doing whatever is convenient and requires the least effort, picking any cones they see and collecting any seeds they find, thereby contributing to the spread of inferior varieties and a decline in the quality of man made forests of Yunnan pine.

From this may be seen that in order to improve the quality of Yunnan pine and plant straight trunk pines in which the grain in the wood is straight and which grow rapidly, it is necessary to begin with the selection of superior varieties. In order to do this, each afforestation unit must first set up its own mother forests and nurseries, themselves conscientiously selecting trees, collecting seeds, and propagating trees. Second is that for newly afforested areas, suitable varieties for afforestation must be selected with no blind change in varieties made. Third is before the selection of superior varieties, each area should select varieties and bring in varieties from places where the climate and the afforested areas are similar and where forest productivity is high. At the time of seed collection, selection should be made from superior forest trees older than 25 years of age, and mother trees should be additionally selected only from among those trees in the forests that are sturdy, have round, straight, and tall trunks, and are not infected with diseases or insect pests. Only in this way can good seeds be collected and later generations of superior Yunnan pines be propagated.

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ZHEJIANG

## IMPROVEMENT OF RURAL PRODUCTION RESPONSIBILITY SYSTEM DISCUSSED

Hangzhou ZHEJIANG RIBAO in Chinese 28, 30 Nov 80; 2, 4, 6, 12, 14, Dec 80

[Thirty-five Questions and Answers prepared by Xu Wanshan [1776 5502 1472], Feng Guangjun [7458 0342 6511] and Dr Jiaxing [2629 0502 2502]

[28 Nov 80 p 2]

[Text] (Editor's Note) To strengthen the agricultural production responsibility system is a central item of current rural work. In response to our readers' request, the rural section of this paper recently invited the comrades working for the Management and Administration Bureau of the Provincial Commission of Agricultural to join it in a half-month investigation. These 35 questions and answers to be published in successive issues of this paper for public reference are based on the findings of the investigation and the experience of some successful production teams.

Realizing that the system of "small lot contracting for remuneration according to quotas" has been practiced for many years in our province and is known to all the localities, the "questions and answers" are meant to offer appropriate solutions to problems which are likely to arise in implementing the responsibility system of specialization contracting for remunerations according to combined output. Instead of seeking uniformity and "cut and dried" rules, the production teams of all localities must proceed from actual conditions and the production needs of various sectors when they establish and strengthen the system of responsibility.

After reading the "questions and answers," if our readers still find other problems regarding the strengthening of the agricultural production responsibility system which must be studied and resolved, we hope they will let us know. We will prepare more "questions and answers" in the light of actual conditions.

1. What is an agricultural production responsibility system?

An agricultural production responsibility system is a system of scientific management of the collective economy by the rural people's communes. To systematically organize the production labor force and assign precise production tasks to the production units or individuals, the production brigades, production teams and commune enterprises must lay down in no uncertain terms the tasks they must take on, the power they have to have in carrying out their tasks and the bonuses and penalties they will receive in accordance with their success or failure in completing their tasks in order to make them assume economic responsibilities for the production tasks they have contracted to perform. These are the essentials of an agricultural production responsibility system.

2. Why is it necessary to improve and strengthen the production responsibility system?

The collective economy is the unshakable foundation on which the modernization of our agriculture rests. As attested to by the history of agricultural development in the past 20 years, it is much more superior to the individual economy. However, due to excessive demand for collectivization which overshadowed the principle of adjustment to what is locally feasible and due to obstructions arising from the extreme leftist line, the management and administration of the people's communes have become the weakest link. For a long time, there has been very little improvement or breakthrough in carrying out the principle of distribution according to work and the establishment of a healthy production responsibility system. This has depressed the socialist activism of the peasants and arrested the role of the superiority of the collective economy. Due to management dislocation, the collective economy has not fared very well in some localities, so much so that the people are losing faith in the collective economy. That is why the Chinese Communist Party Central Committee points out emphatically in its document on improving and strengthening the agricultural production responsibility system that "Today the improvement of management and administration, the implementation of distribution according to work and the strengthening of the production responsibility system should be regarded as the pivot leading to further reinforcement of the collective economy and the development of agricultural production. We must work arduously to make them function satisfactorily."

According to the experience of many communes and production teams, the "production responsibility system is a 'key' to control poverty and achieve prosperity." A healthy responsibility system will do away with the lack of proper personnel to look after the production operations of the communes and production teams, make everyone responsible and face difficulties together, tie together the fruit of collective labor and material interests of every commune member so as to make them "love" the collective economy and work actively for collective production. It also encourages the hardworking commune members to earn more by more work and stops the laggards who do not work hard from profiting at the expense of others. This helps the implementation of the socialist principle of from each according to his ability and to each according to his work and thereby brings into play the enthusiasm of the working masses to tap hidden potentials and exhaust all available means to increase production and earn more income.

3. What are the forms of agricultural production responsibility systems?

Since the cooperativization of agriculture, the masses of our province have devised in actual practice many forms of production responsibility systems. Collective responsibility and individual responsibility systems are used to indicate the kind of responsibility assumed. Permanent and seasonal responsibility systems are used to indicate the duration of the responsibility assumed. Total responsibility and specialization responsibility systems are used to indicate the scope of responsibility assumed. However, there are two major types which cover both the responsibility assumed and the resultant fruit of labor. One of the two is called "small lot contracting for remuneration according to quotas" which is the system of operations responsibility for both the quality and quantity of labor. The other is the system of responsibility based on "contract of labor and production for remuneration according to combined output," which guarantees volume of the final fruit of labor (output value). According to actual experience, both systems are good and welcome by the masses. Inspired by the spirit of the Third Plenum of the Central Committee, some cadres and members of the communes and production teams, who have liberated their thinking and dare to explore, have worked out a system of specialization contracting for remuneration according to the combined volume of output, a system of responsibility for the volume of production which the masses like even more.

4. How can the production teams select a suitable system of responsibility?

When a production team begins to establish a system of production responsibility, it must consider first its level of productivity. A system of responsibility must match a given level of productivity so as to accelerate to the fullest extent the development of production. It must consider its own size and the commodities it plans to produce. "Contracts of labor and production for remuneration according to combined output" may be good for one production team while another may be better off with "small lot contracting for remuneration according to quotas." Some production teams may have to use several different systems of responsibility simultaneously. At any rate, the production responsibility system of any production team must be based on actual conditions and locally compatible. Any system of production responsibility which encourages the producers of care for collective production, helps increase production and income and improves the quality of products is good. There is no need to seek any particular "cut and dried" model. It can be achieved only by adhering to the principle of voluntary popular support. Give the commune members ample opportunity to deliberate on a system of responsibility to be established and then decide on it in a democratic way.

It takes courage and patience to set a good production responsibility system. However, it is by no means difficult and troublesome if the leadership is resolved to rely on the masses and practice it continually.

5. What is the responsibility system of specialization contracting for remuneration according to combined output and what are the advantages?

The responsibility system of specialization contracting for remunerations according to combined output denotes coordinated division of work according to individual ability and rational organization of the labor force to contract singly for production work in agriculture, forestry, animal husbandry, sideline production, fishery, industry and commerce. The contracted production work for various sectors is assigned according to production facilities and management advantages to different units, individual workers or households. The work contracted is distributed in a unified manner while production over or below the contracted amount is rewarded or penalized accordingly. All these are covered by contracts for a year or several years.

This form of production responsibility system fosters the productive enthusiasm of individual commune members on the one hand and brings into full play the best quality of unified management and coordinated division of work. It helps strengthen the position of the production team as a principal economic entity, leads to diversified economic operations and promotes scientific farming and accelerates the production of commercial goods. It maximizes the utilization of human, material and locally available resources, helps the commune members to look after their household sideline production and provides for the livelihood and production acitivites of both dependent households as well as households which are short in manpower.

6. How to organize by specialization under the system of specialization contracting for remuneration according to combined output?

To organize by specialization means to form different units for different business projects. As a matter of principle, each project should form one unit. A big project which requires more labor force may form several units while piecemeal projects which do not need the formation of any unit at all may be contracted by specialization households or individuals. However, several closely related small project units, such as mountain and forest products units or sideline products units, may combine to form a specialization unit. In a word, the size of a specialization unit depends on its production requirements and the extent of mechanization. The standard should be flexible enough to meet its actual needs. For instance, the size of a grain and edible oil unit which concentrates on farm work should be limited to about 15-20 workers. An organization of such a size simplifies both labor management and pay schedules. It meets roughly the year in and year out production needs and facilitates the deployment of labor to make full use of such farm machinery as electric grain threshers.

7. How to schedule rationally the labor force of various specialization units?

There are two factors involved in a rational scheduling of the labor force of the specialization units: (1) Does it meet the production requirements of these units, and (2) is it based generally on "division of work according to ability?"

Although there are more ways than one to figure out the actual amount of labor each sector wants to commit to production, a comparatively simple approach is to work out a rational figure which represents the actual amount of labor a sector plans to commit to production for a particular year on the basis of its work quota or the actual amount of labor it committed to production in the preceding year or a number of years. In the case of a new project, an estimation of labor requirement may be reached in a democratic manner.

Having worked out the total labor force commitment of a year by a production sector, the next step is to find out the number of workers it actually requires. This can be figured out on the strength of the actual work-points scored in a year by a 10 base points unit of labor force during the preceding year or a number of years. For instance, if a production team with a 10 base points labor force scored 3,500 work points this year, it, as a specialization unit, will need a 100 base points labor force in the following year in order to commit 35,000 work-points to production. This data provides a rational proration of full and half labor force quotas between man and woman workers of the various specialization units.

The realization of "division of work according to ability" benefits both the collective economy and the commune members. But it is difficult to do it. The most serious problem which often occurs in practice is the contradiction between the requirement of the whole unit and wishes of individual commune members. To resolve this contradiction, some advanced production teams gather together their key cadres to work out a preliminary plan for labor placements based on the principle of "three advantages and one accommodation." That is to say, the plan is advantageous to production, advantageous to maximum utilization of special talents, advantageous to unity and accommodates the production and livelihood requirements of the commune members. The plan is then presented to the commune members for democratic deliberations in order to reach a decision by consultation and readjustment. This satisfies the group and the commune members. Other production teams which resorted to such simple approaches as decision by the cadres, free choice by commune members and drawing lots have not been able to reach satisfactory results.

8. How to allot farmland to units specializing in grains, cotton and edible oil cultivation?

The allotment of land by a production team which has only one unit specializing in grain and edible oil cultivation or in cotton cultivation is comparatively simple. It becomes more complex when a production team happens to have more than one unit specializing in grain and edible oil cultivation or cotton cultivation. There are two different ways to resolve the problem. One approach is to mark out the land in lots according to crop schedules. Take winter crops for example. The land may be divided into lots, one for rape, one for wheat, another for grass seeds and so on. Each lot may be subdivided and given to several units which specialize in grain and edible oil cultivation. This is good for plains and rice-growing regions. Even though the lots of different specialization units may crisscross each other, the overall cultivation is not interrupted. This works favorably for mechanized farming and unified irrigation and pest control. The other approach is to divide the land into several farming lots according to its natural conditions and allot them permanently to nearby specialization units. This suits a production team whose commune members and farmlands are scattered.

9. How to select specialization unit leaders?

Once a specialization unit is formed and given its allotted farmland, the next problem its commune members must tackle is the selection of a unit leader. The masses say: "In the past we usually select a unit leader who is not contentious and easy to get along with. Now we want a talented and creative unit leader."

To select a good unit leader, we must bring democracy into fullplay. The selection may be achieved by secret balloting by the commune members after they have deliberated once and again over their favorite candidates. The party committee of the production team may recommend to the specialization unit a capable candidate who is experienced in production, fair, capable and knows how to rally the masses to be elected in a democratic manner by the masses. A deputy production team leader or a commissar of the team may serve as leader of a specialization unit concurrently if elected by the commune members.

During an election proceeding, the leadership of the commune and production team concerned must see to it that ideological preparations are properly done to insure a successful election acceptable to the masses.

[30 Nov 80 p 2]

[Text] 10. What are the contents of specialization contracts for the various sectors?

The contents of a specialization contract for any sector of the economy depends on the projects involved. Some contracts require "three bids" while others may require "five bids." No matter what the projects are, such a contract must contain what are commonly known as "three bids and one reward." This means to undertake to achieve a given amount and value of output for a given number of work points at a given production cost, plus reward and penalty provisions.

11. How can a production team get a specialization unit to contract to achieve a given amount and value of output?

A contract bidding to achieve a given amount and value of output should be reasonable. But what constitutes reasonableness? The popular concept of reasonableness is "to reach as high as one can touch on the tips of this toes." This means there must be enough margin left for the specialization unit to maximize its effort to produce over the contract limit for rewards. If the bidding is too low, it will hurt production as the target is too easy to fulfill. If the bidding is too high, it will make people lose confidence in their ability to overfulfill the target. Both extremes are unhealthy.

In contracting for a given amount and value of output of grain, cotton and edible oil, the production is subject to forces of nature, and the margin for changes should be bigger. Some production teams base their biddings on the average of the most recent 3 years. This is a proper approach because it takes into consideration a good year, an average year and a lean year. It also takes into consideration the state, collective and individual needs for improvement of livelihood as well as the possibility of increasing production.

Some perenial economic crops, such as tea, fruit trees, tung oil trees and tea oil trees, grow through a prime picking period, a bumper picking period and a period of decline. Some of them even show differences in yield due to longer and shorter years. All these must be considered in contracting for a given amount and value of production. The contract ought to provide for graduated annual increase of production during the transition from the prime picking period to the bumper picking period. By the same token provisions should be made to cover graduated annual reduction of production during the transition from the bumper picking period to the period of decline. Different production quotas should also be worked out for shorter and longer years.

12. How to contract for performance of work?

Contracting for performance of work must be done with care and indiscriminate "offers" must be avoided.

Like contracting for a given amount and value of production, contracting for performance of work must wait until the production plan and technological preparations for the coming year are formulated. A realistic and scientific approach is to set the amount of labor each specialization unit can contract for according to the quotas of labor. Any production team which does not have labor quotas or has only incomplete labor quotas can work this out in the light of the actual units of labor used by the various sectors in the preceding year or several years.

13. How to contract for a fixed amount of production cost?

To contract for a fixed amount of production cost means to bid to complete a production project at a fixed cost. This includes seeds, commercial fertilizers, pesticides, expenses of irrigation and machine farming, the purchase of small farming implements and repair costs. The index of contracting to complete a production project at a fixed cost may be deliberated and decided upon by the commune members in the light of the actual expenditures of the past few years or the preceding year. This should be included in the contract. In recent years the production cost in various localities has been too high and wasteful. Today when we set ceilings on production cost, we must calculate carefully and keep them under strict control. Once a bid is made for production at a given cost, no overruns will be reimbursed but savings are to be kept by the specialization unit.

In the past few years, the specialization units were reluctant to stockpile manure after the system of contracting for produciton at a given cost was promoted by the production teams. This regards the growth of agricultural production. But what can we do about it? Apart from ideological reasons, this phenomenon is due to poor management. A simple solution to this problem is to set aside at the conclusion of the contract a number of work points or funds for the collection and stockpiling of manure according to the production requirement of the specialization units concerned. But they are included in the contracted cost of production. The workpoints earned by a specialization unit by collecting manure are paid as non-contractual work of the production team. The cost of stockpiling manure is borne by the production team and deducted at the end of the fiscal year from the total production cost of the production team. The task of collecting and stockpiling manure set by the production team for its specialization units should be distributed to all the households and individual workers. Each household or worker should be assigned a basic total of manure to collect and contribute.

14. How to figure out reasonable rewards and damage payments for the various specialization units?

Rewards are a form of encouragement given by a production team to its specialization units for the over-quota labor they committed to overfulfill their production targets. Damage payments are a form of economic responsibility borne by a specialization unit for losses during production caused by poor management. Consequently both rewards and damage payments must be reasonable and equitable in and between the various sectors.

Reasonable and equitable rewards and damage payments must be based on careful consideration of the production conditions of the specialization units concerned, the efforts required to achieve contracted production and over-quota production as well as the amount of labor committed to do the job. There should be definite ratios between rewards and payments of damage, full reward and full payment of damages, more reward than payment of damages, very few rewards and very few payments of damage, or only reward without payment for damages. What can be used for reward? Most people favor awarding of workpoints or cash, though award in kind is generally discouraged. Some production teams situated in mountainous regions, due to inadequate grain rations received by commune members are in favor of award in grain. If that were the case, award in grain is also acceptable.

Under normal conditions, both rewards and damage payments must be carried out and no production team is at liberty to revoke a contract providing for rewards and damage payments. In case of full reward, the production team should deduct its required accumulation according to the accumulation ratio for the current year before making the award. The reason for this is simple. Even though over-quota production is achieved principally by the specialization units concerned, the role played by the leadership of the production team and the support provided by other related units still cannot be overlooked.

How can rewards and damage payments reach the individuals? This is done by means of workpoints. Rewards may be based on workpoints actually earned so that "one who works more gets more." To make remunerations and responsibility for damage carry equal weight, payments of damage should be based on the base workpoints of commune members.

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[Text] 15. What is computation of workpoint according to net earnings and its advantages?

To compute workpoints according to net earnings is a concrete representation of the system of specialization contracting for remunerations according to combined output. Based on "three bids," to contract to use a given number of workpoints to produce a given amount of product at a given cost, the formula is used to devise a schedule of computing workpoints according to net earnings for the settlement of accounts. This simplifies the final annual settlement of accounts and encourages the specialization units concerned to work actively to increase production and cut down cost. It is well received by the masses because it makes people increase production and cut down cost in order to earn more income for themselves.

The formula to compute workpoints on the basis of "three bids" is: (Contracted amount and value of output - production cost) ÷ contracted workpoints = the net earnings of contracted work of a worker (10 points). The formula to settle accounts for year-end distribution is as follows: The new earnings of the specialization unit ÷ the net earnings of the contracted work of a worker of the unit = the total workpoints actually due the specialization unit. These workpoints of all the specialization units and other non-contractual workpoints such as those for agricultural capital construction and time loss incurred by cadres are totalled up by the production team concerned for unified distribution. The settlement of accounts within each specialization unit is the same as that of specialization contracting.

16. Should a production team engaged in a comparatively simple line of production adopt the responsibility system of specialization contracting?

The form of a responsibility system should be compatible with the needs of developing production. A small production team which is rated low in productivity and in the level of management has no immediate need to adopt the specialization contracting responsibility system.

Those larger production teams may adopt progressively the system of specialization contracting for whatever projects they have if the masses so desire, provided it is done "to introduce specialization for existing projects and to develop new projects if none exists" as they rally the masses to explore production potentials and open up new channels of production while drawing production plans for the coming year. In doing so, they must be sure it meets the production requirements, helps concentrate on the principal projects without overlooking miniprojects and allows the production teams to acquire experience for extending specialization.

The "small but exclusive" system of remuneration according to combined output should be avoided. The experience of our province shows that unsuccessful "small but exclusive" system of remuneration according to combined output often leads to fragmentation of production teams.

17. What projects may be contracted by specialization individuals and households?

Judging by the conditions in our province, expansive field production and diversified operations should be contracted by specialized units rather than individuals or households. Individual commune members with technical know-how may contract to run scattered sundry fields, boxed-in fields small patches of hilly land away from village centers and "odd shaped fields"; or small dams and ponds; or miscellaneous economic crops which require technical skill but are limited in volume such as fruit trees and bamboo groves; or apiculture and pig breeding; or sideline undertakings such as trading games and chicken feathers for sugar; or small stores, barber shops and snack counters owned by the production team, provided their bids are considered and accepted by the commune members. In a word, solutions to this problem, as a matter of principle, should be conducive to production growth and the consolidation and betterment of the collective economy. Do what is beneficial but avoid what is harmful.

18. What should the term of specialization contracts be?

The term of contracts for various projects depends on the production cycles of the crops involved and the management level of the production team concerned.

There are several advantages to set the term of a specialization contract for bamboo and timber production to run for a fixed number of years as the production cycles of bamboo and timber vary from 5 to 6 years up to several decades. For instance, some production engaged in afforestation at a forestry base has concluded contracts with some specialization units based on "four quotas and one reward." The term of the contracts is 3 years during which the specialization units are entitled to the grass and firewood in the hilly land under their management and share the produce of crops interplanted among young trees. By the end of the 3-year period, if the survival rate exceeds the quota, a 20 cent reward will be awarded for each tree over and above the quota while a 10 cent penalty will be imposed for each tree short of the quota. This has worked so effectively to rally the commune members to push forth the afforestation that the survival rate is as high as 98 percent and the phenomenon of "wasteful annual afforestation without any forest anywhere to be seen" is finally brought to an end.

Contracts with longer duration for such perenial economic crops as tea and citrus fruits have proved equally rewarding. Some production teams which adopted contract with a fixed term of several years for tea production based on a responsibility system of remuneration according to combined output has found its tea plantation prosper and production increase many fold.

Although the period of growth of paddy and sundry grains is not very long, the way these crops are treated one year is bound to have great bearing on their production the following year. Some production teams which tried to have specialization contract for a term of several years is warmly supported by the masses.

In a word, the term of contract for production may cover a longer period if the masses so desire and the production team is able to provide comparable management. This would help the specialization unit to become established and plan for the future, to do well the production work of the current year and work actively to set up the necessary agricultural capital construction to facilitate further development of agricultural production. This does not mean the term of all contracts should be the longer the better or that all production projects will last a fixed number of years. Some projects, such as animal husbandry, industrial sideline projects, are comparatively unstable. The rule is therefore not applicable.

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[Text] 19. What must a production team do after the responsibility system of specializations contracting for remuneration according to combined output is put into practice?

A production team is the basic accounting unit of the rural people's commune. The team committee under the charge of the team leader directs all the production, livelihood and welfare activities of the whole team. With most of its routine production work taken over by its various specialization units when the system of specialization contracting for remuneration according to combined output is put into practice, the production team ought to focus its attention on "four matters for integration and two points of respect."

The "four matters for integration" are: (1) Integration of production plans, including long term production plans, production plans of the current year and plans of agricultural capital construction. After the production plans of the current year are finalized, the masses should be rallied to work at specialization contracting and conclude contracts. (2) Integration of labor and material. The production team has overall authority to dispatch workers who engage in industrial sideline production away from the team as well as to allocate all means of production under its control. (3) Integration of revenue and expenditures. Enforce unitary bookkeeping and unitary accounting for the entire team. (4) Integration of the settlement of accounts and distribution. The production team prepares a consolidated schedule for distributing grains, cash and principal agricultural sideline products to the households and individuals. The "two points of respect" are: (1) Respect the decision-making power of the several specialization units, and (2) respect the democratic rights of all the members of the team.

20. What decision-making powers should a specialization unit have?

The specialization units are contracting units, working organizations, under a production team. To insure fulfillment of contracted tasks, the production team should give necessary decision-making powers to the specialization units. Abiding by the unified leadership of the production team, a specialization unit may exercise its decision-making powers to improve its production and management, raise its labor productivity and increase its earnings. The rights and obligations of a specialization unit are simply "four decision-making powers and one obligation." The "decision-making powers" are: (1) the power to plan farm work and organize its labor force; (2) the power to inspect the quality of farm work and accept inspected produce; (3) the power to schedule how much to pay the commune members for their labor; and (4) the power to use all means of production within the scope of a contract it has entered into.

The "one obligation" implies an obligation to have a firm overall viewpoint and uphold the collective interests of the production team, as well as to volumtarily accept the unified leadership of the production team in the allocation of labor and material, in the management of revenues and expenditures and in settlement of accounts and distribution.

21. How to handle correctly the labor used for agricultural capital construction of the production team?

To expand its reproduction capability, a production team should go as far as possible into agricultural capital construction, such as building and maintaining small dams and ponds, levelling ground, erecting retention walls to preserve soil on tea plantations, constructing warehouses and sunning grounds. Once division of work by specialization and the system of specialization contracting for remuneration according to combined output are adopted, there are two procedures to settle the workpoints used for agricultural capital construction of the production team. First, draw a reasonable amount of labor force from each specialization unit to form a specialization capital construction group to bid for a year's or a single item of capital construction of the production team. After completion of the job, the workpoints are to be settled the way other specialization units settle their accounts. Another procedure is for the production team to allot reasonably its required capital construction of the year to all the specialization units which will complete it according to its uniform capital construction plan within a fixed time limit with a warranty for a given quantity and quality. The workpoints so earned are regarded as non-contractual and distributed along with the rest of the whole team.

22. How to organize labor cooperation between different specialization units?

When a production team carries out specialization contracting, the division of work for its labor force will become more rational. However, each independent unit pursuing a single line of specialization will have fewer workers and may face a shortage of labor in busy seasons or an emergency. Consequently, all the specialization units will need labor cooperation just as they need division of work in science. Only when these two are properly coordinated can a production team bring into full play the effectiveness of unified management so as to insure successful completion of the contracting tasks of the various specialization units.

The amount of time, types of jobs and the number of workpoints to be committed to cooperation between different specialization units should be discussed and decided upon in a democratic manner under the direction of the production team and included in the specialization contracts being concluded. The workpoints actually earned are distributed as non-contractual points. A party to the contract who fails to carry out the contract is liable for economic losses sustained by the other party. The various specialization units can be entered into cooperation contract to swap labor or pay cash for the labor provided. This works favorably to encourage the specialization units to cooperate voluntarily.

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[Text] 23. How to improve the system of responsible use and management of farm animals, farm implements and machinery?

Farm animals are living things. We must encourage democratic assessment of the period of service of each head of cattle and direct the specialization units to let stockmen bid for raising them. These stockmen should be responsible to achieve "five quotas," i.e. a fixed quota of fodder, a fixed state of fattening, a fixed rate of breeding, a fixed amount of manure and a fixed rate of remuneration. A stockman who raises the cattle well earns workpoints or cash award while the one who does not raise the cattle well loses workpoints. A stockman who intentionally injures or causes the death of cattle is liable for damage. Farm animals would be better kept and protected if their users were also the stockmen.

The use and care of small farm implements should be in the same hands. Whoever uses them takes care of them. Take rice baskets of different sizes for example. Except those kept by the specialization units for general use, most of them may be left in the charge of farm households or individual peasants who are paid annually for the service. These are scheduled to last a fixed number of eyars beyond which they may be kept by the care-takers if they are still in good repair. Again take ploughs, rakes and harrows for example. They are left permanently in the charge of the tillers who receive a fixed amount of repair expenses and earn a fixed number of workpoints to keep these implements in good repair for a fixed number of serviceable years, the so-called "three fixed quotas." A care-taker who wilfully damages the implements is obliged to pay for the damage and bear the repair cost. Again, river mud strainers wear out pretty fast. Some production teams leave the strainers to the commune members who strain river mud. Each strainer is allowed 7-10 cents depreciation per day of active use. When it is completely depreciated, further earnings from its use belong to the care-taker. This system has proved quite satisfactory.

All large and medium size farm implements are let out on contract to the production teams which leave them in the charge of the users. Take a tractor for example. Its operator receives fixed pay, a fixed amount of gasoline and fixed repair expense to perform fixed tasks and guarantees its safe use by a responsibility system based on "fixed quotas, guaranty for its safety and rewards." The final accounts are settled machine by machine separately. A care-taker who overfulfills his quota, saves gasoline and expenses receives a reward. One who fails to fulfill his quota satisfactorily takes a cut in his pay and has to pay for wilful damage to the machine.

24. How can a surplus labor force be managed and utilized?

The labor force of a production team should be uniformly managed and put to use. In a locality where there is not much farmland but a sufficient labor force and the people are used to engaging in handicraft work outside the jurisdiction of the production team, it should work out a program to organize such labor to engage in outside collective sideline production, provided it keeps a sufficient labor force to meet the needs of its specialization units.

The production team should seek all possible ways to encourage its specialization units to make better use of their surplus labor force to increase production, cut down cost and produce a greater ratio of commercial commodities.

To strengthen the management of its labor force engaged in outside work, a production team may keep the matter under its direct control or form a separate unit to take charge of the management under its leadership. It may pay the labor force engaged in outside sideline jobs "by the workpoints based on cash earnings." The production team may require the labor force doing outside work to return to work for the team during busy farm seasons for a fixed number of days and hours according to its own production needs.

The commune and production brigade concerned should assist the production teams to open up new areas of production. They should develop wherever practicable more commune industrial and sideline work which requires concentrated use of labor so as to make good use of surplus labor in the enterprises of the commune and the production brigade.

25. How should remunerations "by the workpoints based on cash earnings" be scheduled?

Those who are organized by a production team to engage in outside industrial and sideline work should, according to the rulings of the production team, receive accredited workpoints based on each earnings each month or season. The ratio between a workpoint and the amount of cash earning should be discussed in a democratic manner by the commune members and decided reasonably. The guiding principle is to enable technically skilled commune members to earn a bit more than they do within the team and bring in more income to the production team and yet reasonable enough to make those who stay in the team feel at ease to proceed with their production tasks.

The few who want to engage in individual business must secure the approval of the appropriate organs and reach a contractual agreement with their production team providing for annual contributions and payment of management fees in order to get a permit to engage in outside work or business.

Any individual commune member who engages in outside work but does not make the required contributions or surrenders cash earnings in exchange for workpoints on time will be subject to economic penalties imposed with the approval of the commune members if he remains incorrigible after reeducation.

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[Text] 26. How to pay commune members who work for enterprises run by a production brigade?

Today most of the commune members who work for enterprises run by a production brigade have to return to their own production teams to receive "comparable workpoints." When this pay procedure is used, the brigade enterprises, bound by contracts signed at the beginning of the current year, must deliver on time to the production teams the pay of their commune members who work for the brigade enterprises. The production teams concerned should accredit such commune members with enough workpoints for the amount of labor spent which are then subject to uniform distribution as non-contractual workpoints by the production teams. Even though the distribution of the remunerations of the commune members who work for the brigade is done by the production teams, rewards, however, are handed out at the factories.

Some commune members working for the brigade enterprises who are paid fixed wages must contribute to the accumulated fund of their production teams as decreed and pay cash for their grain and edible oil rations. They pay the same price as other commune members for their basic grain and edible oil rations but have a higher price for any additional portions. Their remunerations and rewards are distributed at the factories where they work.

27. How can a specialization unit make rational use of and pay for its labor?

Even though most specialization units are small, it is still necessary to prevent the trend toward equalitarianism in pay. Avoid "scraping together" the labor force to be put to use. Every person should be given suitable work and right work should go to the right person. If a job is best done by one person, let it be done by one person. If it is best done by several persons, let it be done by several persons. Farm work such as the management and cultivation of wooded hills, tea plantations and paddy fields may be left by the year or season in fixed quotas to the charge of individual workers, provided all planting and harvesting is placed under unified control. Remunerations for labor by quotas should be promoted for farm work based on quotas.

28. How to establish a system of bookkeeping based on unified distribution and unit by unit auditing?

After the adoption of specialization contracting for remuneration according to combined output, the financial administration of the production teams calls for proper readjustments, principally the readjustment of the system of financial administration and bookkeeping. Each production team should include under the headings of farm revenue and expenditure minute entries of the volume and value of the output of its specialization units and contract-related expenditure. The entries of workpoints should set apart contractual and non-contractual workpoints. To insure full performance of contractual obligations, the year-end settlement of accounts should spell out according to contract provisions the rewards and damage payments of the specialization units. Each specialization unit should keep a contracting economic handbook and a workpoints handbook to carry detailed entries of the products it receives, all the economic transactions between itself and the production team, the transfers of labor between itself and the production team and the workpoints earned by the commune members.

The financial administration of the production team and its specialization units must work impartially and strictly and carry complete data and clear-cut book entries.

29. How to organize the distribution of grain, edible oil and other farm products?

After the adoption of the system of specialization contracting for remuneration according to combined output, grain, edible oil and sideline farm products must be distributed by the production teams. The part of the grain produced by the grain and edible oil specialization units which the state purchases must be inspected and accepted according to state regulations. Each specialization unit is responsible for failures to meet the standard. Grain for storage and distribution to the commune members are to be inspected and accepted by the production teams which may refuse to accept sub-standard grain.

Moreover, to abide by the customary practice of the masses, all distributions and settlements of accounts should be announced to every household concerned.

30. How to handle the year-end settlement of accounts of a specialization unit which has not completed its contractual obligations?

First of all, find out why a specialization unit fails to complete its contractual obligations. If the failure is attributable to lack of efforts or poor management, the contractual obligations must be strictly enforced, including payment of damage, if any. If it is due to a force majeure or any unforeseeable event, the payment of damage, after deliberation by the masses, may be reduced. When the same calamity inflicts damage on several specialization units and one of them works especially hard to control the calamity and help mitigate damages to the group, it will receive rewards and be released from payment of damages.

To help those specialization units affected by a calamity, some production teams often take speedy measures or provide material assistance to enable the victims to launch temporary projects to increase production or re-allocate their labor force to take up sideline work to earn more income. If these measures are still inadequate to alleviate the damages inflicted by the calamity, their contractual quotas may be lowered in proportion to the damages sustained by the year-end settlement of their accounts. When several specialization units sustained damage at the same time, their damage should be averaged to form a basis for reducing their contract quotas so that those which dropped most in production do not have to pay too much for the losses while those which dropped very little in production can still manage to overfulfill their quotas. These measures which emphasize production and help the affected specialization units to recoup their losses by means of production are excellent positive approaches based on reality.

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[Text] 31. This year some production brigades have formed specialization teams for machine ploughing and crop protection to contract for farming and anti-insect work of the production teams. Is this type of specialization contracting practicable?

As far as we understand, this type of specialization contracting for a single line of operation has proved promising. Take the experience of one brigade for example. Early this year, the crop protection personnel of its 12 production teams formed a single crop protection group with six large sprayers and 12 manual sprayers. It contracted to control plant diseases and insect pests in 900 mu of paddy field and 286 mu of cotton field run by the brigade. It entered into contracts with the production teams to prevent and treat plant diseases and insect pests. If it succeeds in meeting the specified requirements, it receives 4.8 yuan per mu as remuneration but has to pay for losses if the prevention and treatment failed. Since this is an experiment, the workpoints it earns are kept temporarily by the production teams concerned. As borne out by facts, the group has increased the effectiveness of the prevention and treatment of plant diseases and insect pests by saving pesticides, labor and cost. The amount spent for the prevention and treatment of diseases and pests was 0.65 man-day per mu last September, a drop of 0.56 man-day than a year ago, while the cost of pesticides per mu was 3.34 yuan, a drop of 1.65 yuan than a year ago.

This type of specialized crop protection team, like the specialized seed teams and irrigation teams already existing throughout our province and the farm machine teams and fertilization teams now being organized by some brigades, are all well received by the masses because they meet the need for gradual specialization in agriculture and general social development. The problem now is how to improve and enhance them in actual practice.

32. Is it still necessary to keep the system of "small lot contracting for remuneration according to quotas?"

The system of "small lot contracting for remuneration according to quotas" is simple and flexible and was widely used in our province during the period of agricultural cooperativization. Even now most of the produciton teams of our province still keep it, and no changes are expected in the coming year. It must be noted that both remuneration by quota and small lot contracting are still useful to the specialization units even though the production teams have adopted the system of specialization contracting for remuneration according to combined output. Consequently, we have to keep this system and improve it. Any attempt or suggestion to downgrade or repudiate the system of small lot contracting for remuneration according to quotas is unwarranted.

33. How can the system of "small lot contracting for remuneration according to quotas" be improved?

In the past 2 years our province advanced by leaps and bounds in this particular area. The most impressive achievement is that many production teams which have integrated small lot contracting by the specialization units on the one hand and individual responsibility for certain farm operations on the other are at liberty "to strive for unity where unity is required; to work for division where division is required." This makes the system of remuneration by quotas more realistic and provides better qualitative and quantitative guarantee of the designated farm operations.

Take grain production for example. During the three busy seasons of spring ploughing and transplanting, summer harvesting and planting and fall harvesting and winter planting, while job contracting is done by the specialization units, production quotas are based on land. The day to day field management such as pest control, fertilization and watering for crop flowering in the spring, early and late paddy are handled by full-time appointees of the production teams. The hilling up, weeding and draining for spring crops, paddy cultivation and ditching are assigned to individuals who are released only upon satisfactory completion of his work.

Take the production of cotton as another example. Sowing, fertilization, pest control, drought relief and picking are contracted in small lots by various specialization units. A system of individual responsibilities based on "six specifications," including specified people, specified sectors of land, specified tasks, specified volume and quality, specified amount of time and specified number of workpoints, is placed on the individuals for satisfactory completion of such routine field management chores as ground paring and weeding, thinning and singling of seedlings, pruning and thinning. The individuals are released only upon satisfactory completion of these tasks.

The experience of various localities attests that these measures are realistic and practicable.

34. What can be done for those production teams living on the "three reliance" system which assign production quotas to the households?

The provincial party committee, acting on the strength of a Central Committee document, has acted recently on the problem of assigning production quotas to the households. It points out that we need not and should not assign production quotas to the households as most localities, communes and production teams of our province have been doing well in developing production and the collective economy has been sound. Those localities which "rely on state resale of grain for food, rely on loans to run production and rely on relief for livelihood" as mentioned in the Central Committee document are very few in our province. Those production teams which have already assigned production quotas to the households should observe the provisions of Article 6 of the Central Committee document and uphold the position of the production teams as the mainstay of the economy. Land and wooded mountains are means of production collectively owned by the production teams and no individual is entitled to dispose of, sell or lease them. Farm machinery and implements, farm cattle, warehouses and funds are collective property which may not be divided up. The labor force required to work on agricultural capital construction must be deployed uniformly by the production teams. All products and income derived from contracts are to be distributed by the production teams also.

The communes and production brigades should strengthen their leadership over these production teams, help them to do well in production, support them in developing the collective economy and guide them by all possible means to raise the level of their collectivization.

35. How can the communes and production brigades do satisfactory political ideological work as they improve the production responsibility system?

The adoption of the production responsibility system by various trades does not imply a slackening of all necessary political ideological work. The responsibility system, by no means omnipotent, depends on individual ideological awakening and correct handling of the relations between individuals to play its role as a propellant to production. Consequently, we must strive to revitalize the political ideological work as we improve the production responsibility system for every trade.

All political ideological work must be founded on reality. It must be closely tied to economic activities and always teach the commune members to love and care for the collective organization, to cherish an overall viewpoint, to work unrelentingly for the production teams and to be knowledgeable of the general situation. Let ardor and sincerity lead the peasant masses to love their country and their own collective organization. Apply the socialist principles to the solution of problems arising from the implementation of the production responsibility system. Strive continually to reinforce unity and work as one man for the development of the collective economy.

Exemplary leadership of the cadres is crucial to successful political ideological work and the best way to achieve it is to compare with and commend the advanced. The focus of political ideological work must be placed on practical results rather than mere formality.

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## BRIEFS

SPRING FARMING--As of now, Linan County in Zhejiang Province has delivered 149,000 dan of chemical fertilizers, some 20,000 dan of pesticides and 310,000 pieces of small and medium-sized farm tools to grassroots production units in preparations for spring farming. [Hangzhou Zhejiang Provincial Service in Mandarin 1100 GMT 17 Feb 81]

COUNTRY GRAIN OUTPUT--In 1980 the grain output of Suichang County in Zhejiang was 21.29 million jin more than the previous year, or an increase of 7 percent. [Hangzhou Zhejiang Provincial Service in Mandarin 0400 GMT 19 Feb 81 OW]

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## II. PUBLICATIONS

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# Agronomy

AUTHOR: ZENG Shixiong [2582 0013 7160]
YANG Xiuqing [2799 4423 7230]
LU Zhuangwen [4151 5445 2429]

ORG: All of the South China Agricultural College, Guangzhou

TITLE: "The Heterosis of $F_1$ Hybrids between Oryza sativa subsp. Xian and O. sativa subsp. Geng"

SOURCE: Beijing ZUOWU XUEBAO [ACTA AGRONOMICA SINICA] in Chinese No 4, Dec 80 pp 193-202

TEXT OF ENGLISH ABSTRACT: The heterosis of 27 inter-subspecific hybrids between Xian and Geng was shown to be highly significant in such characteristics as straw weight per plant, number of grains per panicle, tillers per plant, plant height, panicle length, date of heading, panicle density and days to maturity. The hybrids exceeded the parent of the greater value ($P < 0.005$) in all these characteristics, but the ratio of panicles to tillers, filled grains per panicle and percentage of seed setting were evidently lower than those of the average value of both parents ($P < 0.005$). In comparing the $F_1$ hybrids with their parent of greater value, we found the differences in panicles per plant, weight of 1000 grains and grain weight per plant to be insignificant. Through path analysis, we found panicles per plant to have the greatest effect from among seven characteristics on the grain weight per plant of $F_1$ hybrids. Following this characteristic were percentage of seed

[Continuation of ZUOWU XUEBAO No 4, Dec 80 pp 193-202]

setting filled grains per panicle, plant height, panicle density, weight of 1000 grains and date of maturity, named in order of their effect. Studying correlations, we found plant height, panicle length, panicle density, tillers per plant, panicles per plant, total grains per panicle and filled grains per plant of the $F_1$ hybrids to be positively correlated to those of the mid parent at significant levels, while length of panicle, grain weight per plant, straw weight per plant, weight of 1000 grains and date of heading were negatively correlated to those of the mid parents at significant levels.

AUTHOR: YU Zhilong [0205 1807 7127]
LI Taosheng [2621 2711 3932]

ORG: Both of the Department of Biology, Hangzhou University

TITLE: "Genetic Analysis of Seven Agronomic Characteristics in Three Winter Wheat Crosses"

SOURCE: Beijing ZUOWU XUEBAO [ACTA AGRONOMICA SINICA] in Chinese No 4, Dec 80 pp 203-210

TEXT OF ENGLISH ABSTRACT: 1. The material used in this study included the parental lines and the $F_1$, $F_2$, $B_1(P_1 \times F_1)$ and $B_2$ $(P_2 \times F_1)$ derivatives of winter wheat (*Triticum aestivum* L.) cross "Wannian No 2 x Fengchan No 3" (Cross 1), "Norin 110 x Anhwei No 11" (Cross 2) and "Fengchan No 3 x Xuan No 209" (Cross 3). Population means, narrow sense heritability and various gene effects were estimated from seven agronomic characteristics in each cross.
2. The $F_1$ of Cross 3 deviating significantly from the mid-parent values for plant height, tiller number, spikelets per spike, kernels per spike, kernels per spikelet and 100-kernel weight indicated a considerable amount of nonadditive gene action for these characteristics.
3. The magnitude of heritability estimates differed greatly from different crosses. In general, narrow sense heritability estimates were very high for plant height, spikelets per spike, but low for grain yield per plant.

[Continuation of ZUOWU XUEBAO No 4, Dec 80 pp 203-210]

4. No epistasis was detected for kernels per spikelet and 100-kernel weight in Crosses 1, 2 and 3, kernels per spike in Cross 2 and spikelets per spike in Cross 3 (with P ranging from .05 to .975), indicating that the three-parameter model proved to be satisfactory in explaining the genetic differences for these traits. Digenic epistasis was detected for plant height, tiller number and grain yield per plant in all crosses, spikelets per spike in Crosses 1 and 2, and kernels per spike in Crosses 1 and 3, suggesting difficulties would be encountered in selecting for these characteristics.
5. Additive gene effects make a greater contribution to the inheritance of kernels per spikelet, kernels per spike in Cross 2, and 100-kernel weight in Cross 3, indicating the possible improvement of these traits through selection in early generations.
6. In the inheritance of spikelets per spike in Cross 3 and 100-kernel weight in Cross 2, dominant gene effects seem to make a major contribution, which indicates that selection for these traits would be more effective if delayed until later generations.
7. Among the three types of epistatic gene effects, it appeared that additive x additive (aa) and dominance x dominance (dd) were important types of epistasis. In general, additive x dominance (ad) gene effects were of minor importance.

AUTHOR: LIU Jieping [0491 2212 1627]
WANG Jinglin [3769 2529 2651]

ORG: Both of the Department of Biology, Beijing Teachers' College

TITLE: "Effect of Darkness on Pollen Fertility and Seed Setting"

SOURCE: Beijing ZUOWU XUEBAO [ACTA AGRONOMICA SINICA] in Chinese No 4, Dec 80 pp 211-218

TEXT OF ENGLISH ABSTRACT: During the period between the enlargement of sporogenous cells and the formation of pollen mother cells, the entire winter wheat plant was given 72 hours of dark treatment. This resulted in the full abortion of pollen grains and complete failure of seed setting in the spikes covered with parchment paper. However, after manual pollination the treated spikes set seeds up to 90 percent.

There were no starch grains and peroxidase activity found in the binucleate pollen from the treated plants. This is similar to the situation found in wheat male-sterile lines. This physiological method of emasculation may thus be applicable to wheat crossbreeding.

The morphological characteristics of the wheat plant for timing the optimum dark treatment were discussed in detail.

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AUTHOR: ZHONG Guanchang [6945 0385 2940]
GAO Guoan [7559 0948 1344]

ORG: Both of the Northwest Institute of Botany

TITLE: "A Study of the Crosses Between *Triticum aestivum* L. and Octoploid *Agrotriticum*--Inheritance of Several Main Characteristics"

SOURCE: Beijing ZUOWU XUEBAO [ACTA AGRONOMICA SINICA] in Chinese No 4, Dec 80 pp 219-224

TEXT OF ENGLISH ABSTRACT: We have studied the inheritance of several characteristics of the hybrid between *Triticum aestivum* L. and the octoploid *Agrotriticum* which was developed from backcrossing (*T. aestivum* L. x *Agropyron elongatum* or *Agropyron glaucum*) to *T. aestivum* L. The main results are as follows: (1) The seed setting of the immediate crosses and their hybrid progenies are fairly good. (2) In the octoploid *Agrotriticum* many good characteristics, such as resistance to rusts, long spike and multiple floret, probably derived from *Agropyron* can be transferred to the hybrid progenies. (3) Date of heading of $F_1$ tends to approach the earlier parent. (4) Some $F_2$ plants are apparently shorter than the wheat parent. (5) Extensive segregation is found in the hybrid progenies and various types could be used as valuable material for wheat breeding. Therefore, it is an easy and effective method to use octoploid *Agrotriticum* as a parent in the distant hybridization of wheat.

AUTHOR: XU Shuhua [1776 2885 5478]

ORG: Department of Biology, Wuhan University

TITLE: "Cytological Studies on Anther and Pollen Development of Cytoplasmic Male-Sterile Types in Rice"

SOURCE: Beijing ZUOWU XUEBAO [ACTA AGRONOMICA SINICA] in Chinese No 4, Dec 80 pp 225-230

TEXT OF ENGLISH ABSTRACT: Cytological abnormalities were found in the microsporogenesis of two male-sterile types of *Oryza sativa* L., "Honglian" and "Wild Aborted," both being in the same version of *Hua Ai No 15*. These two types of male-sterility differed in their origin of cytoplasm, since the former was derived from the wild rice known as "Red Awn" and the latter was a descendant of the well-known "Wild Aborted" type. Cytological differences were observed in the type and time of pollen abortion between the two types. Based on these observations it is suggested that a nucleus-cytoplasm interaction may play an important role in such developmental processes.

Some anatomical abnormalities were also evident in the anther development of the male-sterile types. A hypothesis of genecytoplasm interaction was emphasized by the author to account for the development of male-sterile types in rice.

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AUTHOR: MA Yuansheng [7456 4878 3932]
JIANG Yuen [5592 0056 1869]
ZHENG Xianqiang [6774 0341 1730]

ORG: All of the Institute of Crop Germplasm Resources, Chinese Academy of Agricultural Sciences

TITLE: "Investigation of the Crossability of Distant Hybridization Between Wheat and Rye"

SOURCE: Beijing ZUOWU XUEBAO [ACTA AGRONOMICA SINICA] in Chinese No 4, Dec 80 pp 231-236

TEXT OF ENGLISH ABSTRACT: The magnitude of crossability varied with the type of crossing. When the octoploid *Trical* was crossed as the female parent with wheat, the rate of seed setting was lower than that of the reciprocal cross, but the seeds were plumper and heavier in test weight, thus assuming better quality for germination. When hexaploid *Triticale* was used as the female parent in crosses with wheat, the crossability was much higher than that of the reciprocal. The $F_1$ seeds obtained in the cross of octoploid *Triticale* (♀) x hexaploid *Triticale* (♂) were usually large and plump.

When octoploid *Triticale* was crossed with wheat, the $F_1$ plants gave seeds readily which grew into plants with 42 chromosomes in most cases. Occasionally chromosome

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fragment and bridge, rings and chromosome lagging were found in meiosis. In the $F_1$ plant of hexaploid Triticale x wheat, we have obtained some seeds which show chromosome abnormalities. The hybrid between octoploid and hexaploid Triticale gave large spikes with good fertility.

AUTHOR: ZHANG Weiqiang [1728 4850 1730]
FAN Qingxia [5400 1987 7209]
SHI Peixin [2457 1014 2450]
WANG Linqing [3769 3829 3237]

ORG: All of the Institute of Atomic Energy Utilization, Chinese Academy of Agricultural Sciences

TITLE: "Investigation on Improving Efficiency for Mutation Breeding of Winter Wheat by the Combined Use of Radiation and Hybridization"

SOURCE: Beijing ZUOWU XUEBAO [ACTA AGRONOMICA SINICA] in Chinese No 4, Dec 80 pp 237-244

TEXT OF ENGLISH ABSTRACT: During 1973-1978, dry wheat seeds of early generation hybrids and their parent varieties were irradiated by $^{60}Co-\gamma$ ray with a dosage of 25 KR. In this paper some general remarks are made on the radiosensitivity and mutation rate of the varieties and hybrids under treatment. Thus, the conclusions could be made in abstract as follows:
1) A good choice of hybrid combination was very important for improving the efficiency of induced mutation. (2) The radiosensitivity of hybrid $M_1$ was higher than that of variety $M_1$, the $F_1M_1$ being the highest. (3) Irradiating dry seeds of early hybrid generations could increase the rate of induced mutation. (4) The mutation rate of $F_2M_2$, $F_3M_2$ and $F_4M_2$ was found to be higher than that of the hybrid

[Continuation of ZUOWU XUEBAO No 4, Dec 80 pp 237-244]

generations, while the $F_2M_2$ was very close to the $F_3M_2$ and the $F_4M_2$ had an evidently lower rate of mutation than the $F_2M_2$ and $F_3M_2$. (5) When the progeny generation of mutation and hybrid was made synchronous, the criteria and efficiency of selection in each generation was strengthened greatly.

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CSO: 4009

AUTHOR: ZHENG Yingren [6774 4481 0086]

ORG: None

TITLE: "Approximate Calculation of Stress and Boundary Line of the Plastic Region of Rocks Surrounding a Round Cave"

SOURCE: Chongqing DIXIA GONGCHENG [UNDERGOUND ENGINEERING] in Chinese No 3, 11 Mar 80 pp 1-7

ABSTRACT: At present, under the condition of equal initial stress in all directions in the strata (i.e.$\lambda_0 = 1$, $\lambda_0$ being the side pressure coefficient) the stress field and its boundary line of the plastic region of rocks surrounding a round cave can be obtained completely with analysis method. If the vertical initial stress and the horizontal initial stress are not equal ($\lambda_0 \neq 1$) then the stress field and the boundary line can be obtained numerically with the aid of the finite unit method only and different methods of concrete computation may produce different results. This paper proposes 2 methods of approximate calculation. Following detailed analysis, it is also suggested that in actual application, the result of the second method here proposed should be adopted.

AUTHOR: YANG Muhuai [2799 1970 2037]

ORG: None

TITLE: "Several Problems Concerning Excavation and Support of Dirt Caves"

SOURCE: Chongqing DIXIA GONGCHENG [UNDERGROUND ENGINEERING] in Chinese No 3, 11 Mar 80 pp 7-10

ABSTRACT: With a large quantity of underground engineering projects for railways, water conservancy, hydroelectrical power, mining, or defense, the work does not necessary proceed through various dirt, rock, or salt media. Sometimes, the work is entirely done under soils. The problem of interaction between the underground structure and the medium of its site remains the same, however. The problem involves the method of handling the pressure exerted by the medium onto the structure and the capacity of the medium to bear the load of the structure. This is an extremely complex problem awaiting urgently for a solution. This paper discusses that portion of the problem concerning the excavation of caves in soil strata and the method of providing adequate supportive measures. Several viewpoints are offered.

AUTHOR: LI Huomu [2621 0129 4476]

ORG: None

TITLE: "Preliminary Application of Hydraulic Lift Scaffold in Underground Engineering Projects"

SOURCE: Chongqing DIXIA GONGCHENG [UNDERGOUND ENGINEERING] in Chinese No 3, 11 Mar 80 pp 10-11

ABSTRACT: The new technique of using hydraulic lift scaffold has been preliminarily adopted in the projects of constructing underground oil tanks in the last 2-3 years. Instead of placing the steel framework inside of the concrete oil tank, the molded scaffolding platform is fastened outside of the tank and moved up and down by a hydraulic lift. This paper explains the technique and the structure of this new work tool. A preliminary estimate indicates a saving of 3250 man/day of work and about 13,000 yuan in cost for every oil tank constructed with this tool.

AUTHOR: BIN-TIAN Zhengze [3453 3944 2398 0463] [Transliteration of a Japanese Name]

ORG: None

TITLE: "Dynamic Observation and Analysis of a Large Underground Oil Tank During an Earthquake"

SOURCE: Chongqing DIXIA GONGCHENG [UNDERGOUND ENGINEERING] in Chinese No 3, 11 Mar 80 pp 40-54

ABSTRACT: In recent years, large undergound tanks are being constructed everywhere to store liquid gas, crude oil, etc. There has not been a sufficiently long historical background for these structures to undergo the test of large earthquakes and especially, most of these are built in soft and weak foundations of the coastal regions. This paper reports a seismic observation by the author of underground oil tanks actually in use to study the dynamic relationship between the strain of the side wall of the tank and the surrounding foundation during an earthquake. This paper originally appeared in A COLLECTION OF CIVIL ENGINEERING PAPERS [in Japanese?] No 273, 78 pp 1-14 and translated into Chinese by CHEN Cailai [7115 2088 0171] for this journal.

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CSO: 4009

AUTHOR: ZHU Jinmin [2612 2417 3046]
BAI Yuanchang [4101 0337 1603]

ORG: None

TITLE: "Comprehensive Discussion of Rock Cave Stability Analysis and Designing and Construction of the Support Structure"

SOURCE: Chongqing DIXIA GONGCHENG [UNDERGOUND ENGINEERING] in Chinese No 12, 11 Dec 80 pp 1-20

ABSTRACT: In the past 3 decades, application of undergound engineering structures has grown rapidly in kinds as well as scale, in China as well as in foreign countries. Whether or not the capital investment of such projects can be reduced, the construction duration can be shortened, and the construction and use of such structures can be made safe depend, to a very large extent, upon a rock stability analysis, which is a complex problem. It is closely related to engineering geology, petro-mechanics, and design engineering. This paper attempts to use domestic and foreign large span rock cave projects as examples to discuss the mechanical characteristics of rocks and rock bodies, the method of analyzing the stability of the adjoining rocks, the method of designing and computing the support structure, the application of classification of tunnel adjoining rocks, and the method of strengthening adjoining rocks.

AUTHOR: LUO Wenbao [5102 2429 6283]

ORG: None

TITLE: "Reasonable Method of Designing Supports for Loessical Caves"

SOURCE: Chongqing DIXIA GONGCHENG [UNDERGOUND ENGINEERING] in Chinese No 12, 11 Dec 80 pp 21-28

ABSTRACT: The loessical strata are mainly sedimentary strata by wind power in the Quaternary Period. Its characteristics include large crevices, with vertical cleavages and pipe-like pores, but capable of maintaining very high vertical slopes. The soil is mainly composed of powder-like grains of 0.05-0.005mm in diameter, with a rich carbonate content and calcium nodules. In Northwestern China, the total loess distribution is 440,000 $km^2$ and the deposit is more than 200m in thickness in some places. In recent years, many tunnels and caves have been constructed in this loessical region. The practice demonstrated that the key to success is the stability of the support structure, which occupies the major portion of the cost of an entire cave. Following an extensive discussion of several currently available or classic methods of designing, an experimental formula, summarized from the experience of 93 engineering projects of this type, is offered. When the support structure is designed in accordance with the formula, safety and relative economy may be guaranteed.

AUTHOR: MOSTKOV, V. M.
REZNIKOV, R.A.

ORG: None

TITLE: "The Static Force Computation Method of the Main Underground Machine Chamber of a Hydroelectric Station"

SOURCE: Chongqing DIXIA GONGCHENG [UNDERGROUND ENGINEERING] in Chinese No 12, 11 Dec 80 pp 63-67

ABSTRACT: This paper discusses at length the theory of comprehensive method of analyzing the stress-strain phenomena of adjoining rocks of a large underground tunnel and the guarantee of its stability. The method is summarized in 10 stages. This paper originally appeared in GIDROTEKHNICH STR-VO [HYDROTECHNIQUE] [in Russian ?] No 1, 79 pp 20-23. It is translated into Chinese for this journal by XU Xianyi [1776 7359 3015].

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CSO: 4009

AUTHOR: HUANG-FU Dexing [4106 3940 1795 5281]

ORG: None

TITLE: "Pumping Water to Store Energy Power Stations Under Development"

SOURCE: Beijing KEXUE SHIYAN [SCIENTIFIC EXPERIMENT] in Chinese No 1, 81 pp 16-17

ABSTRACT: Pumping water to store energy is a well developed concept in such industrially advanced countries as the USA, Japan, and in Europe. In China, it has just begun. The surplus power during a flood season or at midnight is used to pump water to a high reservoir or a regulating tank so as to exchange the head for electrical energy on demand. This type of power station is in reality a versatile power storage tank. This paper explains the many forms of using surplus power to pump water for the purpose of storing energy. In China, the highest head thus created is 65 m in Miyun Reservoir, with a single machine capacity of 12,800 kw. Further development of this technology is being planned.

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TITLE: "Power Generation Atop of a Blast Furnace"

SOURCE: Beijing KEXUE SHIYAN [SCIENTIFIC EXPERIMENT] in Chinese No 1, 81 pp18-19

ABSTRACT: In a thermal power plant, water is changed into steam to produce electric power. When iron is being refined in a blast furnace, hot air is blown from the lower part of the furnace to cause the carbon in the coke to react with the oxygen in the hot air to produce a gas. The interaction between the burning gas and the ore will result in the continuous rise of the gas and settling of the ore. Iron is thus separated from the slag. When a large quantity of hot air is blown into the furnace and when a certain energy level is reached, a pressure-reduction valve atop the furnace will automatically open to release the surplus energy to keep the pressure in the furnace at a safe level. In 1974, a Japanese steel mill was the first to utilize this surplus energy to generate power. By Sep 79, 21 blast furnaces in Japan had adopted this technique. It is estimated that the power used by one million two hundred thousand househoods have thus been generated.

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AUTHOR: HAO Fengyin [6787 7364 0603]

ORG: Deputy Chief, Division of Production, Ministry of Coal

TITLE: "Total Quality Control (TQC) Should be Developed More Vigoriously in the Coal Mining Industry"

SOURCE: Beijing ZHILIANG GUANLI [QUALITY CONTROL] in Chinese No 6, 29 Dec 80 p 1

ABSTRACT: The energy utilization rate of coal is above 65 percent in Japan and only 28 percent in China. The high waste rock content of the coal causes a waste transport capacity of 40 million tons per year. About 50 percent, i.e. one hundred million tons, of coking coal is used as power coal in China. To overcome these unreasonable conditions, the author proposes (1) Establishing the principle of production; (2) A quality responsibility system; (3) Using modern scientific management methods; (4) Establishing methods of scientific planning and work; (5) Fully generate mass support. He also calls for a mobilization of all plants and workers to guarantee the users that the best possible products will be produced.

AUTHOR: None

ORG: Machine Work Section No 5, Paper-making Machine Shop No 2, Tianjin Paper Plant

TITLE: "How Did We Catch Up With Jincheng"

SOURCE: Beijing ZHILIANG GUANLI [QUALITY CONTROL] in Chinese No 6, 29 Dec 80 pp 14-15

ABSTRACT: The Machine Work Section No 5 makes the No 2 cardboard used in double-face printing. The annual production is 12,000 tons. There are 83 workers and the equipment is the 1930's style ordinary paper-making machine, which was made in 1958. The unrest of a decade had resulted in confusion of management and serious deterioration of quality. In 1977, the TQC experience of Japan was adopted to apply mathematical and statistical methods to production. After some strenuous efforts, the various quality indices have now reached the best level in the plant's history. It has now caught up with the quality level of Jincheng Paper Mill No 5 and No 6 of Liaoning, which are the most advanced in the nation. The concrete measures adopted are described.

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TITLE: "Do a Good Job of Civilized Production to Improve the Quality of Sugar"

SOURCE: Beijing ZHILIANG GUANLI [QUALITY CONTROL] in Chinese No 6, 29 Dec 80 p21

ABSTRACT: Everyone knows about the saying "disease enters the body through the mouth." The quality of foods directly affects the health of the people. Qianjiang Sugar Plant is new, with new equipment and new workers. It is, therefore, essential to teach civilized production method. For example, pieces of cotton that had been used to clean the machine or pieces of rags that had been used to mop the floor should be absolutely kept from being mixed into the sugar to affect its quality. At one time, insoluble foreign substance was found to fluctuate between 100-200mg/kg, exceeding the standard set by the ministry. Through dissolution and magnetic absorption tests, the foreign substance was proved to be pieces of rusted iron. Further analysis and inspection disclosed the fact that the pipes connecting the evaporation tanks were not cleaned thoroughly to cause the rust to flow out with the syrup. A thorough cleaning of all the tanks and pipes brought about a great improvement of the quality of the sugar. These and other experiences of the plant are told.

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TITLE: "A Technical and Economic Comparison of Television Satellite and Communications Satellite in the Domestic Satellite System"

SOURCE: Shanghai DIANXIN KUAIBAO [TELECOMMUNICATIONS INFORMATION] in Chinese No 9, 80 pp 1-8

ABSTRACT: Since the first synchronous communications satellite was launched in 1965, international communications satellites have entered the fifth generation. For domestic communications, satellites are officially being used in Canada, the USA, the USSR, Indonesia, and Japan, while 16 countries are leasing the international satellites for domestic communications. In 1976, the International Broadcasting Satellite Conference was held to determine 12GHz as the major frequency band for the television broadcasting satellite, etc. but to this day, the television broadcasting satellite system has not been officially put to use. This paper discusses the technical and economical problems of the 2 types of satellite systems in geographically large countries, such as Canada, the USA, and China. It is the author's opinion, following the analysis, that the establishment of a communications satellite system to take care of television broadcasting on the side is the technically and economically most reasonable way.

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